SERVICE MANUAL

Revision A: 1502250001, Content updated.

mission Mini Split 3D
DC INVERTER AIR CONDITIONER

Models:

MSMBB-12CRDN1-MP0W
MSMBC-18CRDN1-MP0W
MSMBD-22CRDN1-MP5W

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R-410A

ENERGY STAR

WARNING

- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

This Manual Is For Qualified Service Engineer Use Only

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1. Precaution

1.1 Safety Precaution

n To prevent injury to the user or other people and property damage, the following instructions must be followed.

n Incorrect operation due to ignoring instruction will cause harm or damage.

n Before service the unit, be sure to read this service manual at first.

1.2 Warning

Ø Installation

n Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.

There is risk of fire or electric shock.

n For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center.

Do not disassemble or repair the product, there is risk of fire or electric shock.

n Always ground the product.

There is risk of fire or electric shock.

n Install the panel and the cover of control box securely.

There is risk of fire of electric shock.

n Always install a dedicated circuit and breaker.

Improper wiring or installation may cause electric shock.

n Use the correctly rated breaker of fuse.

There is risk of fire or electric shock.

n Do not modify or extend the power cable.

There is risk of fire or electric shock.

n Do not install, remove, or reinstall the unit by yourself (customer).

There is risk of fire, electric shock, explosion, or injury.

n Be caution when unpacking and installing the product.

Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.

n For installation, always contact the dealer or an authorized service center.

n Do not install the product on a defective installation stand.

n Be sure the installation area does not deteriorate with age.

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

n Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.

n Take care to ensure that power cable could not be pulled out or damaged during operation.

There is risk of fire or electric shock.

n Do not place anything on the power cable.

There is risk of fire or electric shock.

n Do not plug or unplug the power supply plug during operation.

There is risk of fire or electric shock.

n Do not touch (operation) the product with wet hands.

n Do not place a heater or other appliance near the power cable.

There is risk of fire and electric shock.

n Do not allow water to run into electrical parts.

It may cause fire, failure of the product, or electric shock.

n Do not store or use flammable gas or combustible near the product.

There is risk of fire or failure of product.

n Do not use the product in a tightly closed space for a long time.

Oxygen deficiency could occur.

n When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.

n If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.

There is risk of electric shock or fire.

n Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.

There is risk of property damage, failure of product, or electric shock.

n Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)

There is risk of physical injury, electric shock, or product failure.

n When the product is soaked, contact an authorized service center.

There is risk of fire or electric shock.

n Be caution that water could not enter the product.

There is risk of fire, electric shock, or product damage.

n Ventilate the product from time to time when operating it together with a stove etc.

There is risk of fire or electric shock.

n Turn the main power off when cleaning or maintaining the product.

There is risk of electric shock.

n When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.

There is risk of product damage or failure, or unintended operation.

n Take care to ensure that nobody could step on or fall onto the outdoor unit.

This could result in personal injury and product damage.

Ø CAUTION

n Always check for gas (refrigerant) leakage after installation or repair of product.

Low refrigerant levels may cause failure of product.

n Install the drain hose to ensure that water is drained away properly.

A bad connection may cause water leakage.

n Keep level even when installing the product.

It can avoid vibration of water leakage.

n Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.

It may cause a problem for your neighbors.

n Use two or more people to lift and transport the product.

n Do not install the product where it will be exposed to sea wind (salt spray) directly.

It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

Ø Operational

n Do not expose the skin directly to cool air for long time. (Do not sit in the draft).

n Do not use the product for special purposes, such as preserving foods, works of art etc. It is a consumer air conditioner, not a precision refrigerant system.

There is risk of damage or loss of property.

n Do not block the inlet or outlet of air flow.

n Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.

There is risk of fire, electric shock, or damage to the plastic parts of the product.

n Do not touch the metal parts of the product when removing the air filter. They are very sharp.

n Do not step on or put anything on the product. (outdoor units)

n Always insert the filter securely. Clean the filter every two weeks or more often if necessary.

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

n Do not insert hands or other objects through air inlet or outlet while the product is operated.

n Do not drink the water drained from the product.

n Use a firm stool or ladder when cleaning or maintaining the product.

Be careful and avoid personal injury.

n Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.

There is risk of fire or explosion.

n Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.

They may burn of explode.

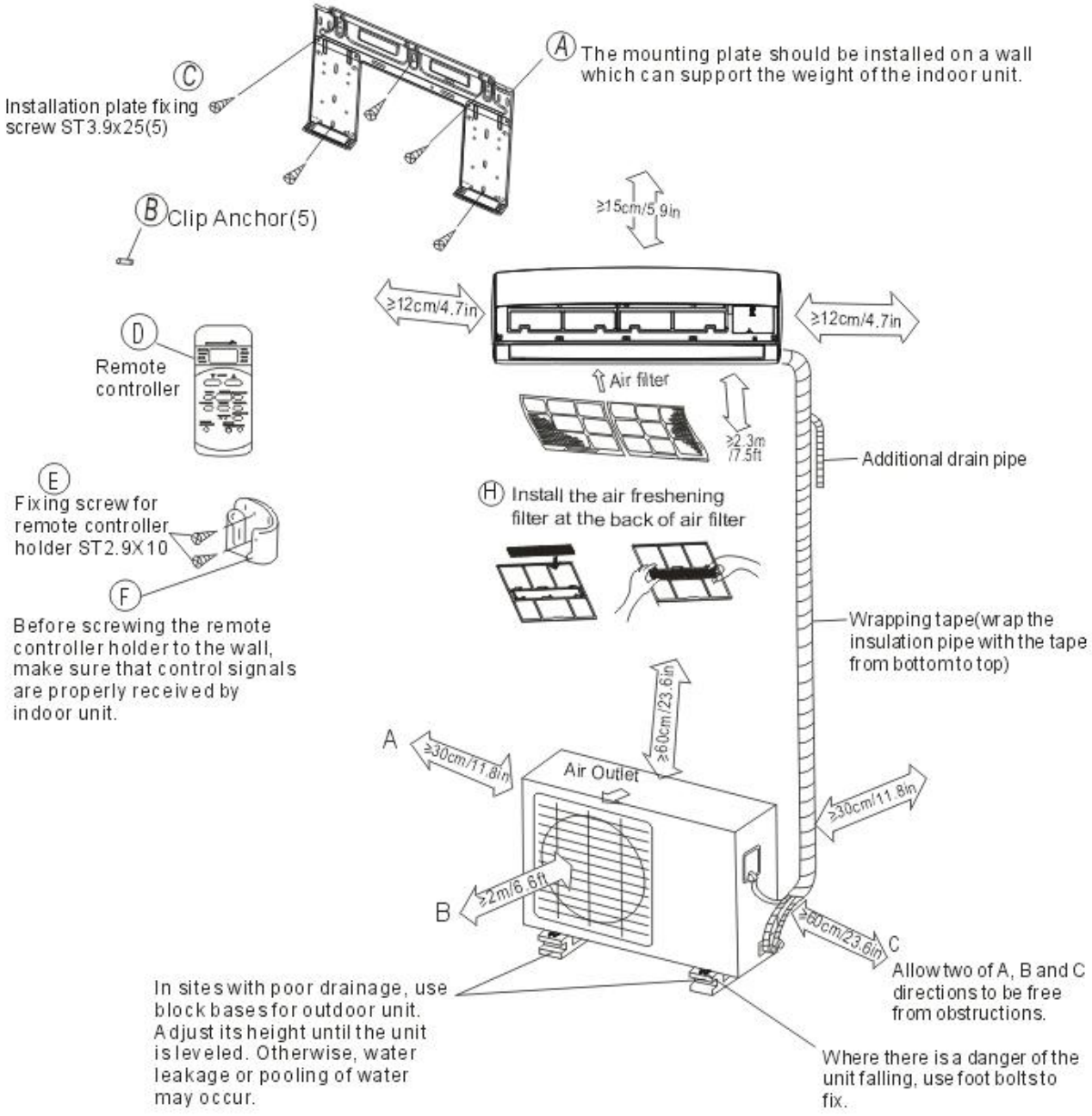
n If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote of the batteries have leaked.

2. Part Names

2.1 Model Names of Indoor/Outdoor units

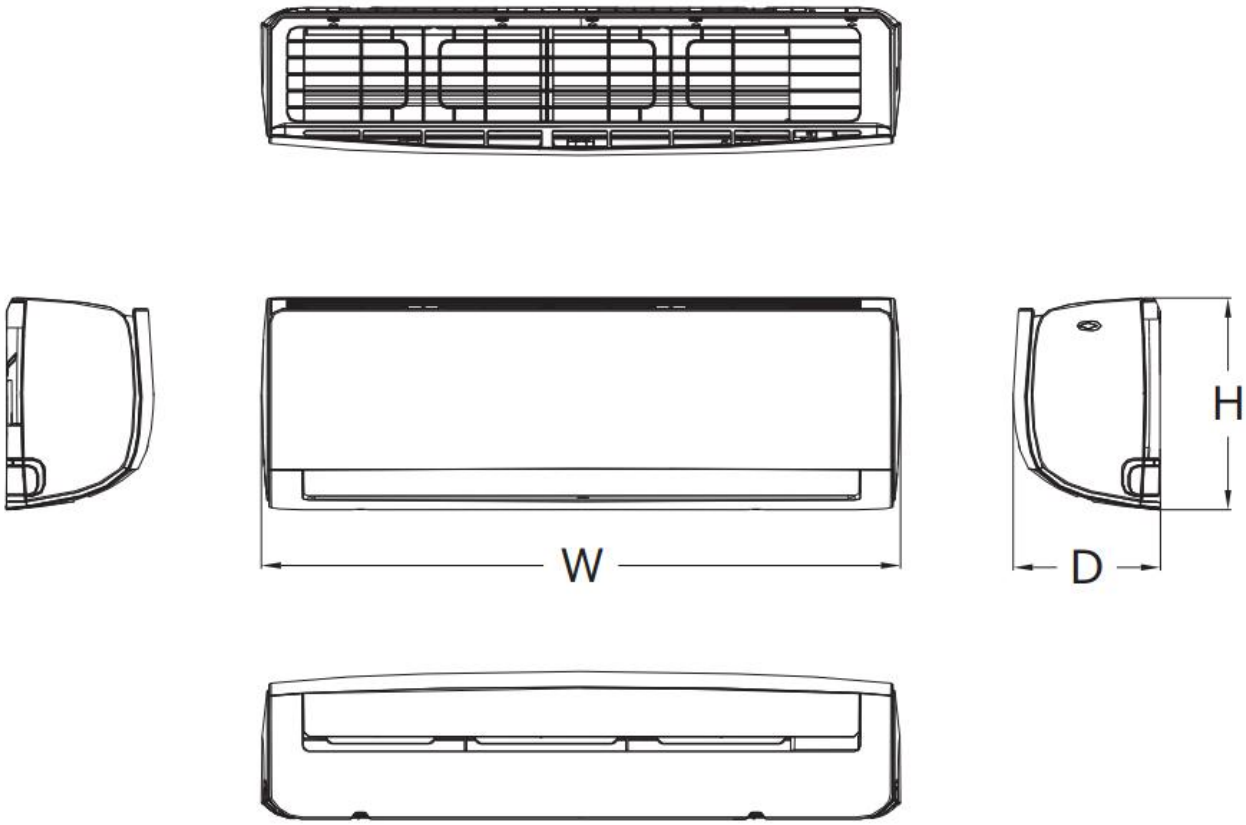
Series	Capacity	Indoor units	Outdoor units
Inverter	12k	MSMBB-12CRDN1-MP0W	MOB1-12CDN1-MP0W
	18k	MSMBC-18CRDN1-MP0W	MOC-18CDN1-MP0W
	22k	MSMBD-22CRDN1-MP5W	MOF1-22CDN1-MP5W

2.2 Part names of Indoor/Outdoor units


C
Installation plate fixing screw ST3.9x25(5)
A
The mounting plate should be installed on a wall which can support the weight of the indoor unit.
B
Clip Anchor(5)
≥15cm/5.9in
≥12cm/4.7in
≥12cm/4.7in
D
Remote controller
Air filter
≥2.3m /7.5ft
Additional drain pipe
E
Fixing screw for remote controller holder ST2.9X10
F
Before screwing the remote controller holder to the wall, make sure that control signals are properly received by indoor unit.
H
Install the air freshening filter at the back of air filter
Wrapping tape(wrap the insulation pipe with the tape from bottom to top)
A
≥30cm/11.8in
≥60cm/23.6in
Air Outlet
≥30cm/11.8in
B
≥2m/6.6ft
≥60cm/23.6in
C
Allow two of A, B and C directions to be free from obstructions.
In sites with poor drainage, use block bases for outdoor unit. Adjust its height until the unit is leveled. Otherwise, water leakage or pooling of water may occur.
Where there is a danger of the unit falling, use foot bolts to fix.

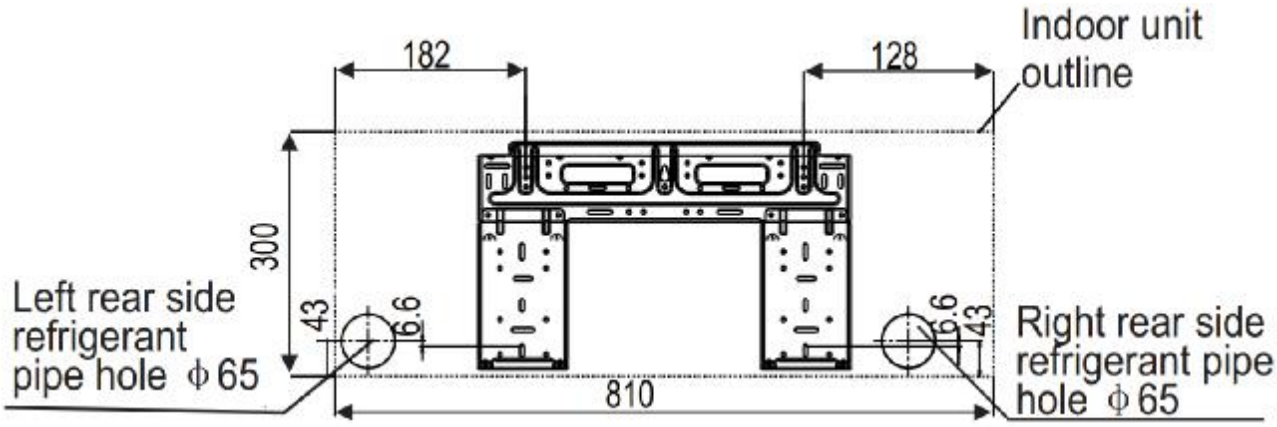
3. Dimension

3.1 Indoor Unit

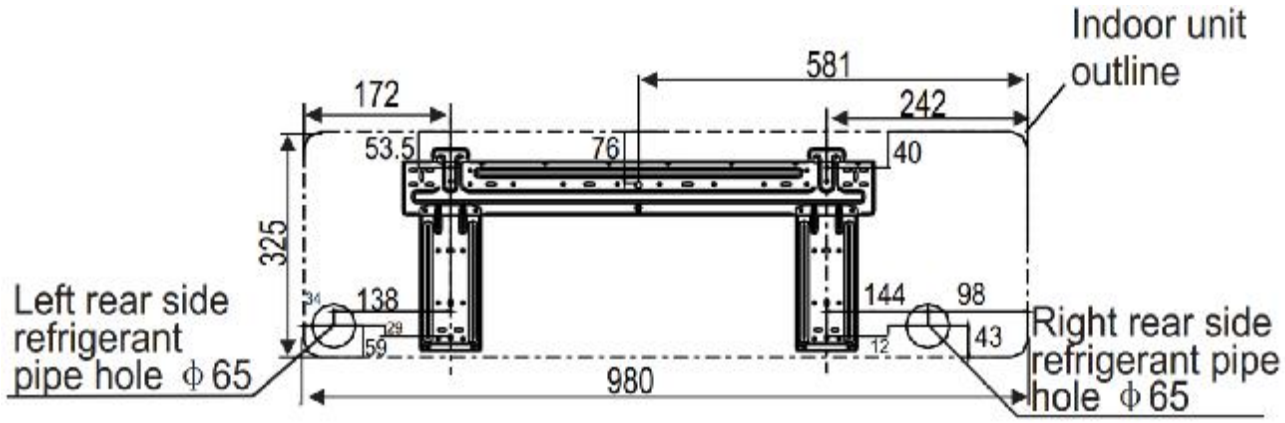


Model	W	D	H
MSMBB-12CRDN1-MP0W	810 mm (31.89in)	200 mm (7.87in)	300 mm (11.81in)
MSMBC-18CRDN1-MP0W	980 mm (38.58in)	225 mm (8.86in)	325 mm (12.80in)
MSMBD-22CRDN1-MP5W	1090 mm (42.91in)	235 mm (9.25in)	338 mm (13.31in)

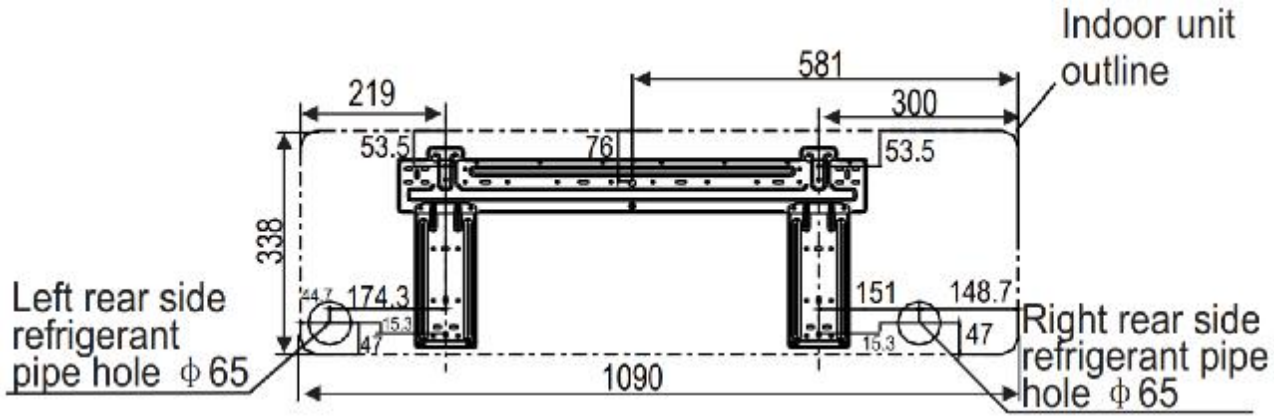
For MSMBB-12CRDN1-MP0W,



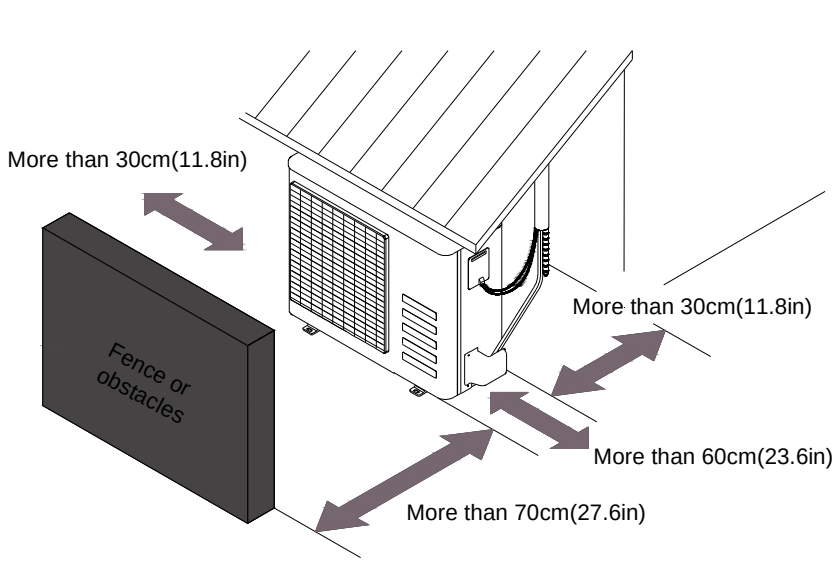
For MSMBC-18CRDN1-MP0W,

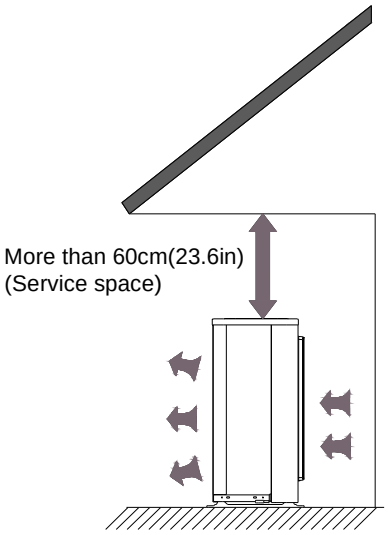


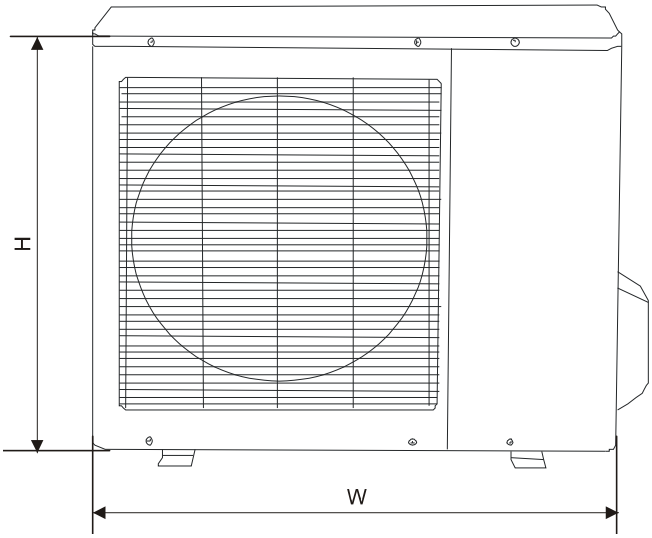
For MSMBD-22CRDN1-MP5W,

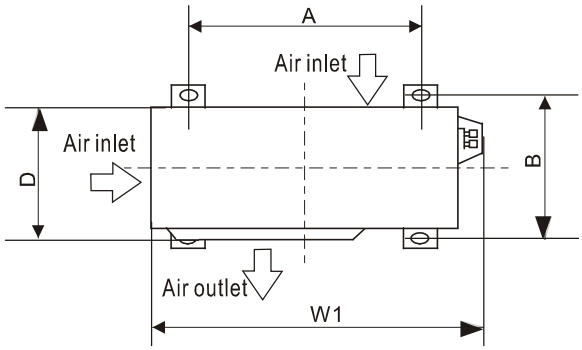


3.2 Outdoor Unit







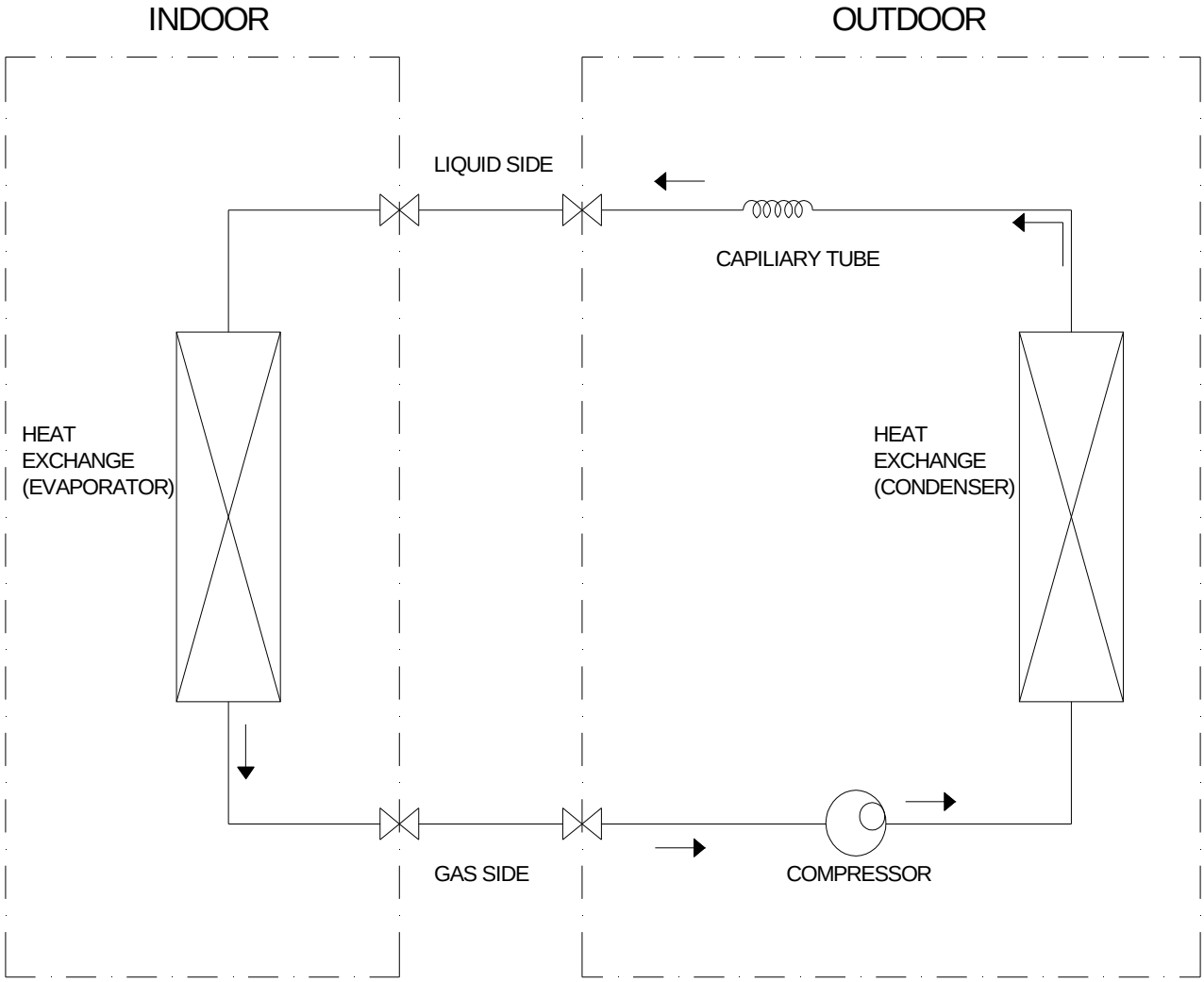


Note: The above drawing is only for reference. The appearance of your units may be different.

Model	W	D	H	W1	A	B
MOB1-12CDN1-MP0W	780mm (30.7in)	250mm (9.8in)	540mm (21.3in)	843mm (33.2in)	549mm (21.6in)	276mm (10.9in)
MOC-18CDN1-MP0W	760 mm (29.92in)	285 mm (11.22in)	590 mm (23.23in)	823 mm (32.4in)	530 mm (50.87in)	290 mm (11.42in)
MOF1-22CDN1-MP5W	845mm (33.3in)	320mm (12.6in)	700mm (27.6in)	908mm (35.7in)	560mm (22.0in)	335mm (13.2in)

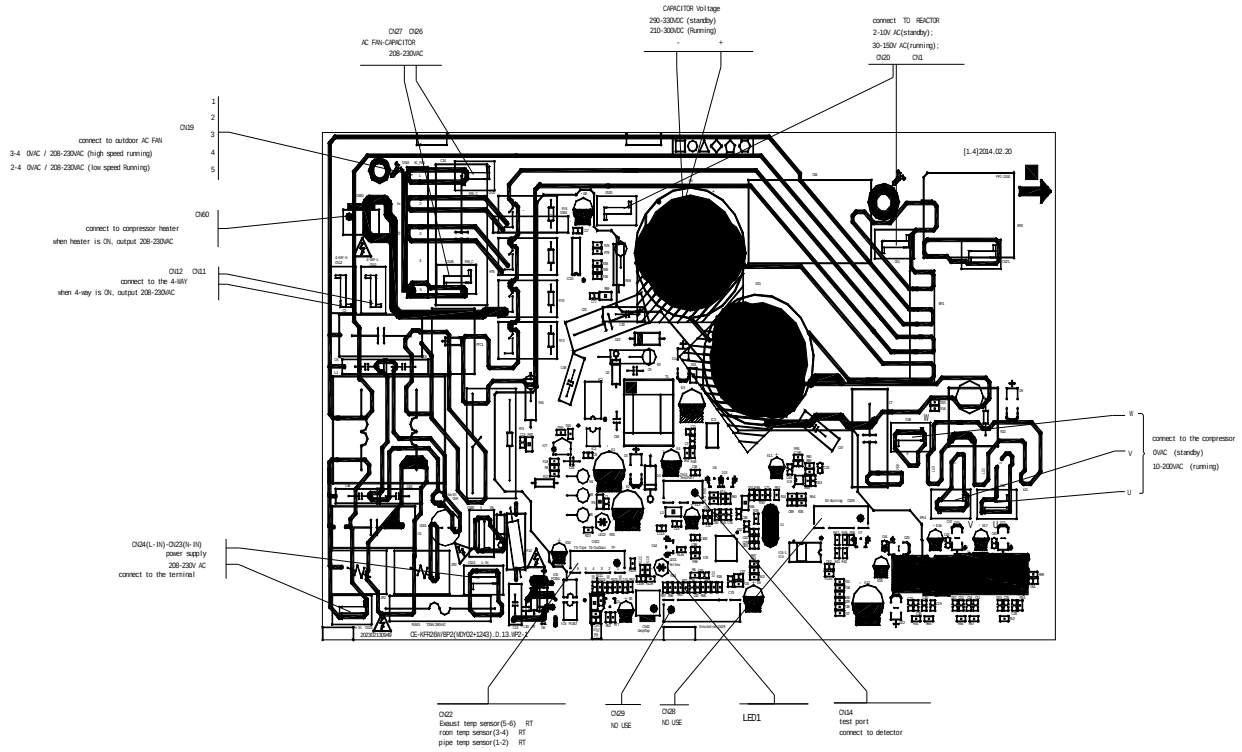
4. Refrigerant Cycle Diagram

For cooling only models,

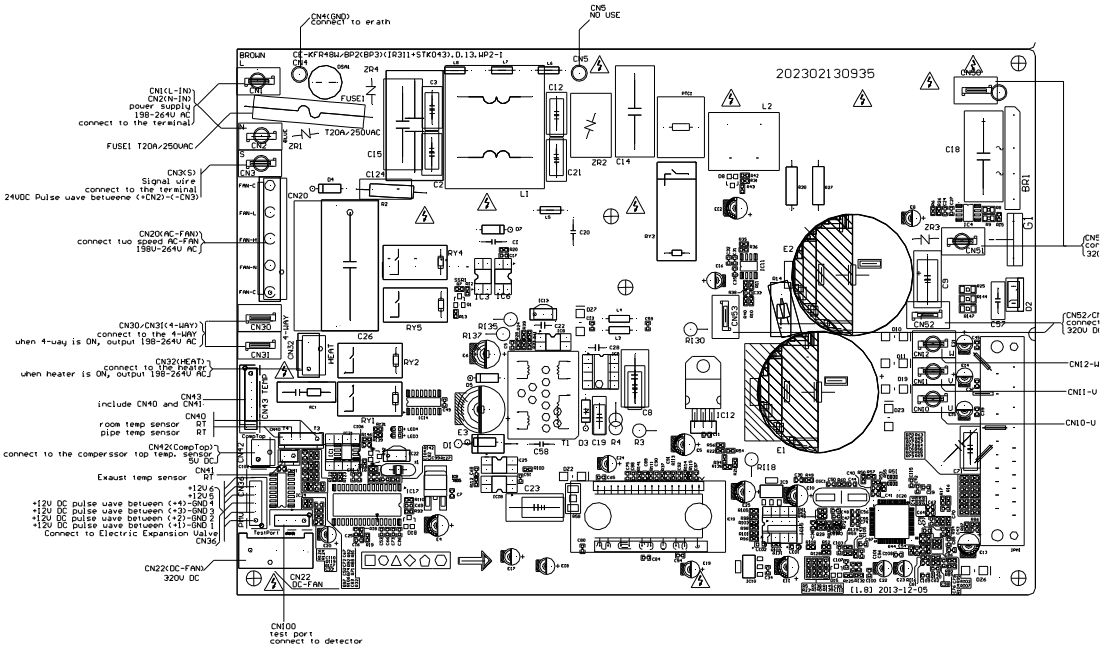


5. Printed Circuit Board Connector Wiring Diagram of Outdoor unit

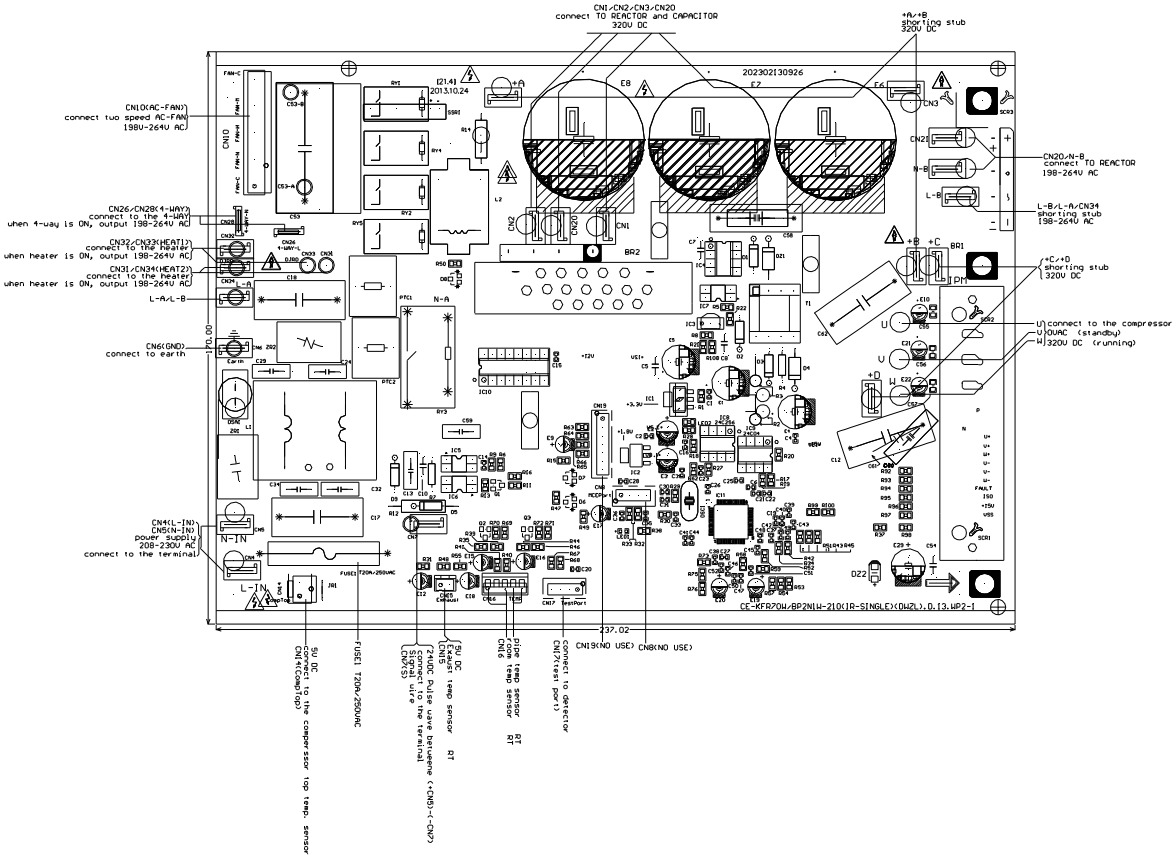
MOB1-12CDN1-MP0W,



MOC-18CDN1-MP0W



MOF1-22CDN1-MP5W



6 Installation Details

6.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
Φ6.35mm	1/4in	1500N.cm(153kgf.cm)	1600N.cm(163kgf.cm)
Φ9.52mm	3/8in	2500N.cm(255kgf.cm)	2600N.cm(265kgf.cm)
Φ12.7mm	1/2in	3500N.cm(357kgf.cm)	3600N.cm(367kgf.cm)
Φ15.9mm	5/8in	4500N.cm(459kgf.cm)	4700N.cm(479kgf.cm)
Φ19mm	3/4in	6500N.cm(663kgf.cm)	6700N.cm(683kgf.cm)

6.2 Connecting the cables

The power cord should be selected according to the following specifications sheet.

Appliance Amps	AWG Wire Size
10	18
13	16
18	14
25	12
30	10

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

6.3 Pipe length and the elevation

Models	Standard length	Max. Elevation	Max. Length A	Additional refrigerant
MSMBB-12CRDN1-MP0W+ MOB1-12CDN1-M P0W	7.5m (24.6ft)	10m (32.8ft)	25m (82.0ft)	15g/m (0.16oz/ft)
MSMBC-18CRDN1-MP0W+ MOC-18CDN1-M P0W	7.5m (24.6ft)	20m (65.6ft)	30m (98.4ft)	15g/m (0.16oz/ft)
MSMBD-22CRDN1-MP5W+MOF1-22CDN1-M P5W	7.5m (24.6ft)	20m (65.6ft)	30m (98.4ft)	30g/m (0.32oz/ft)

Models	Pipe size	
	Gas	Liquid
MSMBB-12CRDN1-MP0W+MOB1-12CDN1-M P0W	3/8in (Φ9.52mm)	1/4in (Φ6.35mm)
MSMBC-18CRDN1-MP0W+MOC-18CDN1-M P0W	1/2in (Φ12.7mm)	1/4in (Φ6.35mm)
MSMBD-22CRDN1-MP5W+MOF1-22CDN1-M P5W	5/8in (Φ15.9mm)	3/8in (Φ9.52mm)

6.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

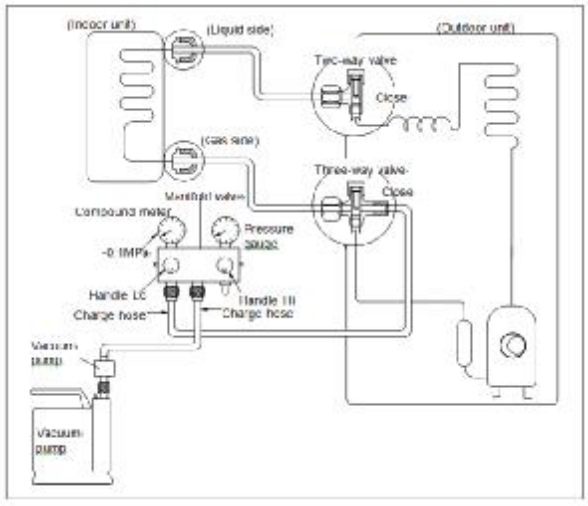
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water when mixed with the refrigerant and oil will create an acid that will damage the motor windings and components in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

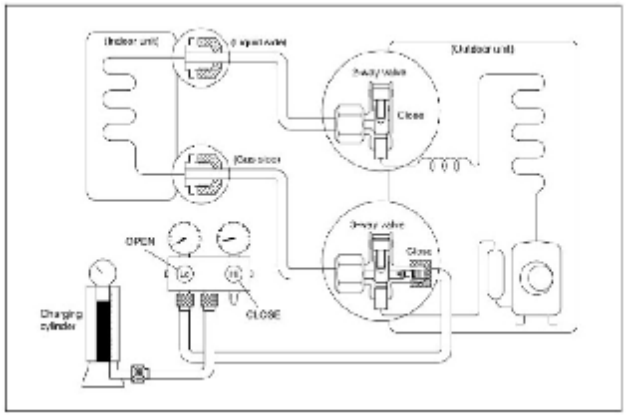
Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit Connections with a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

1. Air purging with vacuum pump



1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the Front seated.
2) Connect the low pressure gauge to the 3 way service valve access port..
3) Connect the middle hose of the gauge manifold (usually yellow) to the vacuum pump.
4) Fully open the handle for the low pressure gauge..
5) Start the vacuum pump and operate according to manufacture spec's.
6) Perform an evacuation for a minimum of 30 minutes and check that the low pressure (compound) gauge indicates a vacuum of 29.9 in/hg (500 microns) A vacuum gauge should be used if available. If the proper vacuum cannot be achieved the vacuum pump should be run for an additional 20 minutes. If after the additional 20 minutes the vacuum still cannot be achieved the is a leak in the system and must be located and repaired. follow the leak checking procedure as mentioned before. If the vacuum is achieved, close the low pressure gauge handle off and shut the vacuum pump off. Recheck the reading after 10 minutes, the vacuum may change slightly, this is normal.
7) The system is now dry and free of contaminates, refrigerant pressure should now be added to the system from a source other than the system before opening the 2 way and 3 way valves for system operation.
8) The 2 way and 3 way valve can now be opened for the system operation

2. Air purging by refrigerant



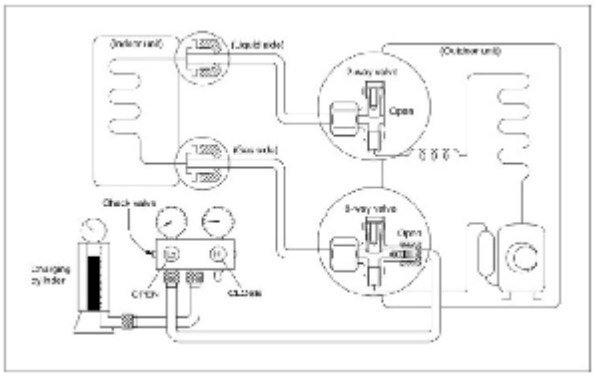
Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). With a container of refrigerant and a gauge manifold set, connect the low pressure gauge hose

to the 3 way valve service port and a charging cylinder to the service port of the 3-way valve.
3). Open the valve on the refrigerant container and the low pressure gauge to allow the refrigerant to enter the system, next loosen the flare connection on the 2 way valve line to purge the air and contaminants from the system for 30 to 50 seconds, then retighten the connection.
4). Next allow the pressure from the refrigerant to reach 100 psi and then close the low pressure gauge and the refrigerant container and check the 2 way and 3 way valve line connections for leaks with liquid soap or electronic leak detector.
5). After the system has been check for leaks the pressure should be adjusted to about 25 to 50 psi.
6). You can now disconnect the gauge manifold and refrigerant container from the system and open the 2 way and 3 way valves for system operation
7). Mount the valve stems nuts and the service port cap.
Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m(13.27 ft.lbs).
Be sure to check the gas leakage.

6.5 Adding the refrigerant after running the system for many years

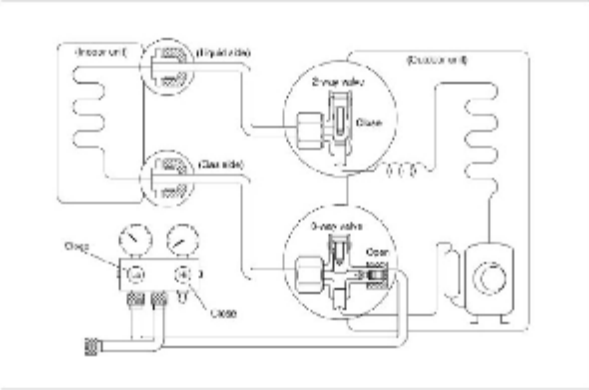


Procedure

1). 1st step; Connect the low pressure gauge from the gauge manifold set to the 3 way service valve (this is the blue hose on most sets) 2nd step; Connect the middle hose from the manifold set to the refrigerant container (this is the yellow line on most sets). with refrigerant 410A the container must be inverted (upside down) when adding the refrigerant. Note that the 2 way and 3 way valves must be in the open position.
3rd step; the air in the gauge hoses needs to be purged out. use the pressure from the system to purge the low side line, loosen the connection on the manifold for a second, next open the to valve on the refrigerant container to pressurize the line, now loosen that hose at the manifold for a second and purge that line.
3) Next step is to set the refrigerant container on an electronic charging scale and record the weight or zero the scale depending on the scale used. Next determine the refrigerant charge to be added.
4) Start the unit in the cooling mode and lower the set point so the unit wont shut off during the charging procedure.
5) Refrigerant can now be added to the system, open the low pressure valve on the gauge manifold set to start charging the unit with liquid refrigerant, keep track of the refrigerant being added to the system (do not overcharge the system)
6). Once the correct charge has been added to the system close the low pressure valve on the gauge manifold set and record the operating pressure. The system is now charged and the unit can be shut off. Close the valve on the refrigerant container and disconnect the hose from the manifold set, also disconnect the hose from the 3 way valve and replace and torque all caps.
7). Mount the valve stem caps and the service port
Use torque wrench to tighten the service port cap to a torque of 18N.m(13.27 ft,lbs).
Always leak check after servicing the refrigerant system.

6.6 Procedure when servicing the indoor unit refrigeration circuit.

1. Pumping down the system (isolating the refrigerant charge in the condensing unit)



Procedure

1). With the unit in the cooling mode and a low set point remove all caps from the 3 way and 2 way valves, next attach the low pressure gauge to the 3 way service valve port and purge the air from that hose by loosening the hose at the manifold for a second, be sure the low pressure gauge valve is closed. **be sure to record the operating pressure**, you will need to know this when you complete the service on the indoor unit and restart the system. Now prepare to close both valves on the unit starting with the 2 way valve (this is called front seating the valve) also prepare to shut the power off to the outdoor unit.

2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.

3). Air purging of the charge hose.

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Now close the 2 way valve and monitor the low pressure gauge. the pressure will start to drop.

5). Operate the unit in the cooling mode and disconnect the power to the outdoor unit when the low side gauge reads a slight vacuum, running the compressor in a vacuum could damage the motor windings. Note that units with extended lines and additional refrigerant charge may not be able to achieve a vacuum, this is because the outdoor unit can only store a certain amount of refrigerant, this is normal (the amperage of the compressor will have to be monitored in this case) Stop compressor when the amperage approaches the name plate FLA rating indicates 0.1Mpa(14.5Psi).

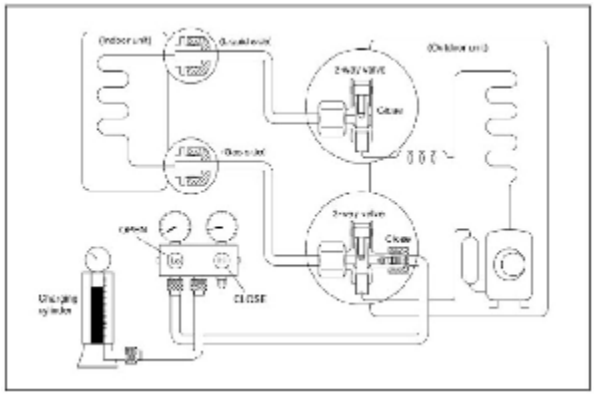
6). Now close the 3 way valve right away. the pressure will rise during this time, this is normal. There will be some pressure left in the system this is normal, The indoor unit is now ready to be serviced.

Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m(= 13.27 ft.lbs).

Be sure to check for gas leakage.

2. Sweeping (air purging) the system with refrigerant after the service to the refrigerant circuit of the indoor unit is complete.



Procedure:

Sweeping the system can be used when the unit has been pumped down, this eliminates the need to loosen the flare connection on the 2 way valve (loosening and retightening flare connections could cause a refrigerant leak)

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve Leave the valve on the Refrigerant container.

3). Do not loosen the flare connection, Start with the hose from the low pressure gauge that has been connected to the 3 way valve service port and loosen it at the gauge manifold connection, next open the 2 way valve 1/2 half of a turn (this will release the refrigerant that has been isolated in the outdoor unit) The refrigerant will travel thru the small refrigerant line and evaporator coil in the indoor unit and back out the low pressure hose that has been loosened let the refrigerant sweep for about 50 seconds, this will push and remove

any air moisture and noncodensables from the refrigeration circuit. After 50 seconds has passed tighten the hose on the low pressure gauge. The sweep is now complete.

Next step, open the 2 way valve all the way then the 3 way valve all the way and check for leaks.

4). Next step, Start the unit in the cooling mode and check the pressure (remember the pressure you recorded?) The unit is going to be low on refrigerant from the sweeping process, add refrigerant as needed from the refrigerant container in the liquid state to achieve the operating pressure that you recorded. The process is now complete.

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3Mpa(43.5Psi) to 0.5 Mpa(72.5Psi).

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position

Be sure to use a hexagonal wrench to operate the valve stems.

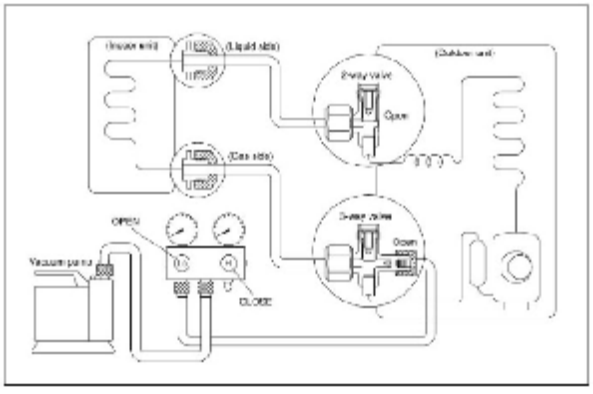
7). Mount the valve stems nuts and the service port cap

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

6.7 Evacuation after servicing the outdoor unit refrigeration circuit.

1. Evacuation of the complete refrigeration circuit, Indoor and outdoor unit.



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the opened position.

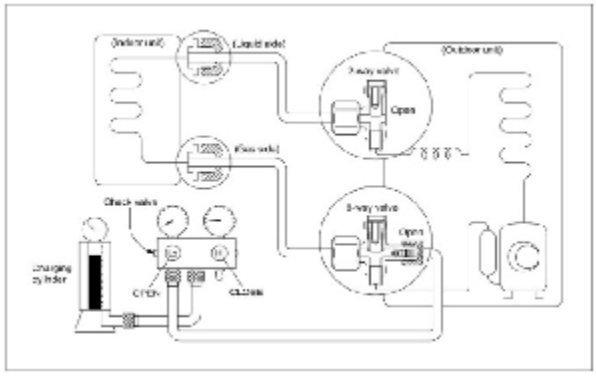
2). Connect the vacuum pump to 3-way valve's service port.

3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa(14.5Psi), 500 Microns / 29.9 in,hg.

4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

5). Disconnect the charge hose from the vacuum pump.

2. Refrigerant charging



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant

If the system cannot be charge with the specified amount of refrigerant, or can be

charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve’s service port immediately

If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mounted the valve stem caps and the service port. Use torque wrench to tighten the service port cap to a torque of 18N.m. Be sure to check for gas leakage.

7. Operation Characteristics

<table>
<tr><th>Temperature
Mode</th><th>Cooling operation</th><th>Heating operation</th><th>Drying operation</th></tr>
<tr><td>Room temperature</td><td>17℃ ~ 32℃
(62℉ ~ 90℉)</td><td>0℃ ~ 30℃
(32℉ ~ 86℉)</td><td>10℃ ~ 32℃
(50℉ ~ 90℉)</td></tr>
<tr><td rowspan="2">Outdoor temperature</td><td>0°C ~ 50°C
(32°F ~ 122°F)</td><td rowspan="2">-15°C ~ 30°C
(5°F ~ 86°F)</td><td rowspan="2">0°C ~ 50°C
(32°F ~ 122°F)</td></tr>
<tr><td>-15°C ~ 50°C
(5°F ~ 122°F)
(For the models with
low temperature cooling system)</td></tr>
</table>

$$\Delta T(°F) = \frac{9\Delta T(℃)}{5} + 32$$

CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.

2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.

3. The optimum performance will be achieved during this operating temperature zone.

8. Electronic function

8.1 Abbreviation

T1: Indoor room temperature

T2: Coil temperature of evaporator

T3: Coil temperature of condenser

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

8.2 Display function

8.2.1 Icon explanation on indoor display board.

Digital display:

Displays the temperature settings when the air conditioner is operational.

Displays the room temperature in FAN mode.

Displays the self-diagnostic codes.

Dispalys ‘ON’ for three seconds when Timer ON, Fresh, Swing, Turbo or Silence feature is activated.

Dispalys ‘OF’ for three seconds when Timer OFF is set.

Dispalys ‘OF’ for three seconds when Fresh, Swing, Turbo or Silence feature is cancelled.

Dispalys ‘dF’ under deforsting operation.

Dispalys ‘cF’ when anti-cold air feature is activated under heating mode.

Dispalys ‘SC’ during self clean operation (if aplicable).

Dispalys ‘FP’ under 8℃ heating operation (if aplicable).

When ECO function(optional) is actived,the “88” illuminates gradually one by one as E→C→0→set temperature→E ….

In one second interval.

WIFI control display(optional)

Displays when the WIFI control feature is acticated.(Not available when the unit does not have this function)

NOTE:

A guide on using the infrared remotr is included in this literature package.

8.3 Main Protection

8.3.1 Three minutes delay at restart for compressor

Less than 1 minute delay for the 1st time stand-up and 3 minutes delay for others.

8.3.2 Temperature protection of compressor top

The unit will stop working when the compressor top temp. protector cut off, and will restart after the compressor top temp. protector restart.

8.3.3 Temperature protection of compressor discharge

Compressor discharge temp. T5>115℃(239°F) for 5s, compressor stops.

8.3.4 Fan speed is out of control

When Indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure

8.3.5 Inverter module protection

The Inverter module has a protection function about current, voltage and temperature. If these protections happen, the corresponding code will display on indoor unit and the unit will stop working.

8.3.6 Indoor fan delayed open function

When the unit starts up, the louver will be active immediately and the indoor fan will open 10s later.

If the unit runs in heating mode, the indoor fan will be also controlled by anti-cold wind function.

8.3.7 Compressor preheating functions

Preheating permitting condition:

When T4(outdoor ambient temperature)＜ 3°C(37.4°F), the preheating function will be activated.

8.3.8 Sensor protection at open circuit and breaking disconnection.

When there's only one temperature sensor in malfunction , the air conditioner will keep working but show the error code, in case of any emergency use.

When there's more than one temperature sensor in malfunction, the air conditioner will stop working

8.3.9 Zero crossing detection error protection

If AC detects time interval is not correct, the unit will stop and the LED will display the failure.

8.3.10 Refrigerant leakage detection

This function is only active in cooling mode. It can better prevent the compressor being damaged by refrigerant leakage or compressor overload.

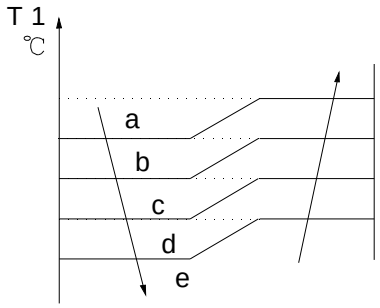
Open condition:

When compressor is active, the value of the Coil temperature of evaporator T2 has no change or very little change.

8.4 Operation Modes and Functions

8.4.1 Fan mode

(1) Outdoor fan and compressor stop.
(2) Temperature setting function is disabled, and no setting temperature is displayed.
(3) Indoor fan can be set to high/med/low/auto.
(4) The louver operates same as in cooling mode.
(5) Auto fan:



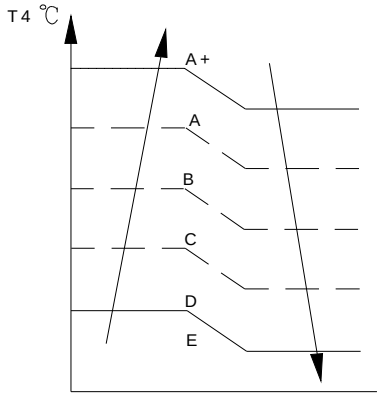
8.4.2 Cooling Mode

8.4.2.1 Compressor running rules

When T1-Ts<-2℃(28.4°F), the compressor will stop,
when T1—T_S>-0.5℃(31.1°F),， the compressor will be activated.
When the AC run in mute mode, the compressor will run with low frequency.
When the current is more than setting value, the current protection function will be activated, and the compressor will stop.

8.4.2.1 Outdoor fan running rules

The outdoor unit will be run at different fan speed according to T4.
For different outdoor units,the fan speeds are different

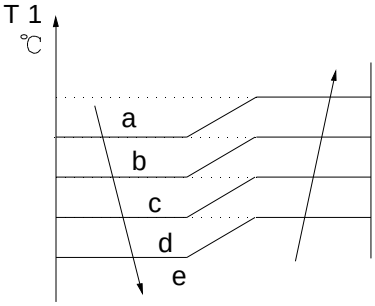


8.4.2.2 Indoor fan running rules

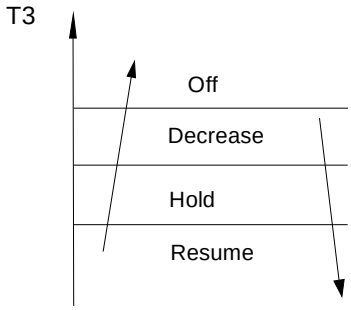
In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto.
When the setting temp. is reached,if the compressor stop running,indoor fan motor will run in Minimum speed or setting speed.
The indoor fan is controlled as below:

Setting fan speed	T1-Td ℃(°F)	Actual fan speed
H	A	H+(H+=H+G)
	B	H（=H）
	C	H-（H-=H-G)
M	D	M+(M+=M+Z)
	E	M(M=M)
	F	M-(M-=M-Z)
L	G	L+(L+=L+D)
	H	L(L=L)
	I	L-(L-=L-D)

The auto fan acts as below rules:



8.4.2.3 Condenser temperature protection



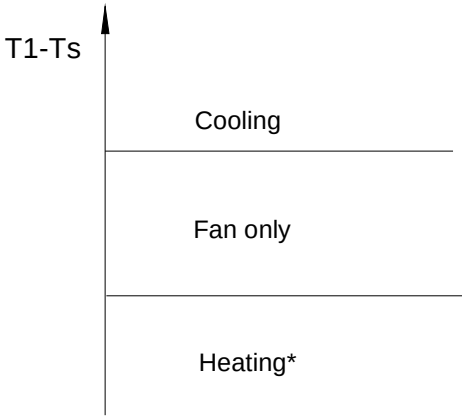
When condenser temperature temp. is more than setting value, the compressor will stop.

8.4.2.5 Evaporator temperature protection

When Evaporator temperature temp.is less than setting value, the compressor will stop

8.4.4 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 17°C(62.6°F)~30°C(86°F). In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).



Heating*: For cooling only models, they will run at fan speed

Indoor fan will run at auto fan of the relevant mode.

The louver operates same as in relevant mode.

If the machine switches mode between heating and cooling, the compressor will keep stopping for certain time and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

8.4.5 Drying mode

8.4.5.1 Indoor fan speed is fixed at breeze and can't be changed. The louver angle is the same as in cooling mode.

8.4.5.3 Low indoor room temperature protection

In drying mode, if room temperature is lower than 10°C(50°F), the compressor will stop and not resume until room temperature exceeds 12°C(53.6°F).

8.4.5.4 Evaporator anti-freezing protection, condenser high temperature protection and outdoor unit frequency limit are active and the same as that in cooling mode.

8.4.5.5 The outdoor fan operates the same as in cooling mode.

8.4.6 Forced operation function

8.4.6.1 Enter forced operation function:

When the machine is off, pressing the touch button will carry the machine to forced auto mode. If pressing the button once again within 5 seconds, the machine will turn into forced cooling mode.

In forced auto, forced cooling or any other operation mode, pressing touch button will turn off the machine.

8.4.6.2 In forced operation mode, all general protections and remote control are available.

8.4.6.3 Operation rules:

Forced cooling mode:

The compressor runs at F2 frequency and indoor fan runs as breeze. After running for 30 minutes. the machine will turn to auto mode as 24°C(75.2°F) setting temperature.

Forced auto mode:

The action of forced auto mode is the same as normal auto mode with 24°C(75.2°F) setting temperature.

8.4.7 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including swing function) automatically after 3 minutes when power returns.

If the memorization condition is forced cooling mode, the unit will run in cooling mode for 30 minutes and turn to auto mode as 24°C(75.2°F) setting temp.

If AC is off before power off and AC is required to start up now, the compressor will have 1 minute delay when power on. Other conditions, the compressor will have 3 minutes delay when restarts.

7.4.10 Point check function

Press the LED DISPLAY or LED or MUTE button of the remote controller three times, and then press the AIR DIRECTION or SWING button three times in ten seconds, the buzzer will keep ring for two seconds. The air conditioner will enter into the information enquiry status. You can press the LED DISPLAY or AIR DIRECTION button to check the next or front item's information.

When the AC enter the "information enquiry" status, it will display the code name in 2 seconds, the details are as follows.

Enquiry information	Displaying code	Meaning
T1	T1	T1 temp.
T2	T2	T2 temp.
T3	T3	T3 temp.
T4	T4	T4 temp.
T2B	Tb	T2B temp.
TP	TP	TP temp.
TH	TH	TH temp.
Targeted Frequency	FT	Targeted Frequency
Actual Frequency	Fr	Actual Frequency
Indoor fan speed	IF	Indoor fan speed
Outdoor fan speed	OF	Outdoor fan speed
EXV opening angle	LA	EXV opening angle
Compressor continuous running time	CT	Compressor continuous running time
Causes of compressor stop.	ST	Causes of compressor stop.
Reserve	A0	
Reserve	A1	
Reserve	b0	
Reserve	b1	
Reserve	b2	
Reserve	b3	
Reserve	b4	
Reserve	b5	
Reserve	b6	
Reserve	dL	
Reserve	Ac	
Reserve	Uo	
Reserve	Td	

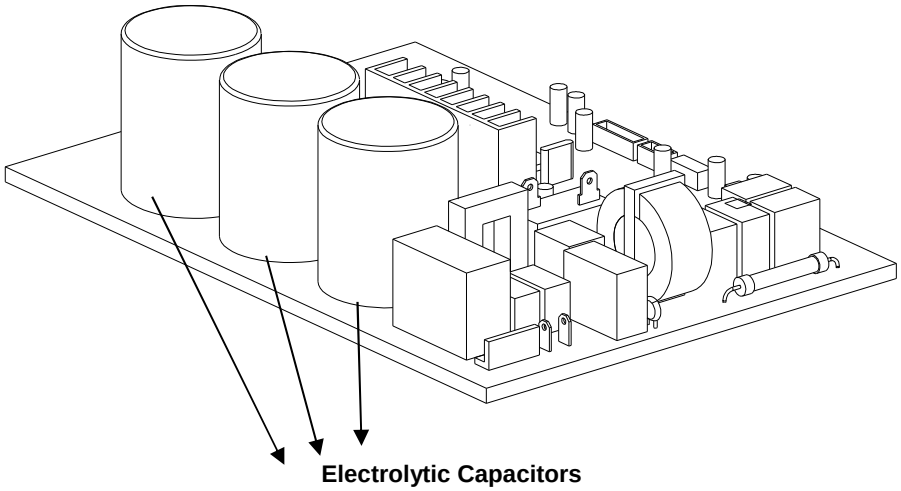
When the AC enter into the information enquiry status, it will display the code value in the next 25s, the details are as follows.

Enquiry information	Display value	Meaning	Remark
T1,T2,T3,T4, T2B,TP,TH, Targeted Frequency, Actual Frequency	-1F,-1E,-1d,-1c,-1b,-1A	-25,-24,-23,-22,-21,-20	1. All the displaying temperature is actual value. 2. All the temperature is °C no matter what kind of remote controller is used. 3. T1,T2,T3,T4,T2B display range:-25~70, TP display range:-20~130. 4. Frequency display range: 0~159HZ. 5. If the actual value exceeds the range, it will display the maximum value or minimum value.
	-19—99	-19—99	
	A0,A1,…A9	100,101,…109	
	b0,b1,…b9	110,111,…119	
	c0,c1,…c9	120,121,…129	
	d0,d1,…d9	130,131,…139	
	E0,E1,…E9	140,141,…149	
	F0,F1,…F9	150,151,…159	
Indoor fan speed /Outdoor fan speed	0	OFF	
	1,2,3,4	Low speed, Medium speed, High speed, Turbo	For some big capacity motors.
	14-FF	Actual fan speed=Display value turns to decimal value and then multiply 10. The unit is RPM.	For some small capacity motors, display value is from 14-FF(hexadecimal), the corresponding fan speed range is from 200-2550RPM.
EXV opening angle	0-FF	Actual EXV opening value=Display value turns to decimal value and then multiply 2.	
Compressor continuous running time	0-FF	0-255 minutes	If the actual value exceeds the range, it will display the maximum value or minimum value.
Causes of compressor stop.	0-99	For the detailed meaning, please consult with engineer	Decimal display
Reserve	0-FF		

9. Troubleshooting

Safety

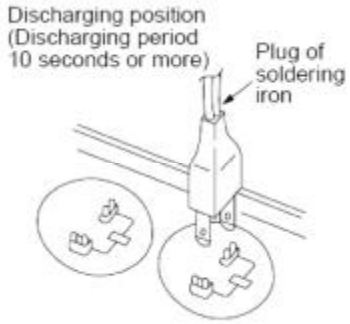
Electricity power is still kept in capacitors even the power supply is shut off. Do not forget to discharge the electricity power in capacitor.



Electrolytic Capacitors

(HIGH VOLTAGE! CAUTION!)

For other models, please connect discharge resistance (approx.100Ω 40W) or soldering iron (plug) between +, - terminals of the electrolytic capacitor on the contrary side of the outdoor PCB.



Note: The picture above is only for reference. The plug of your side may be different.

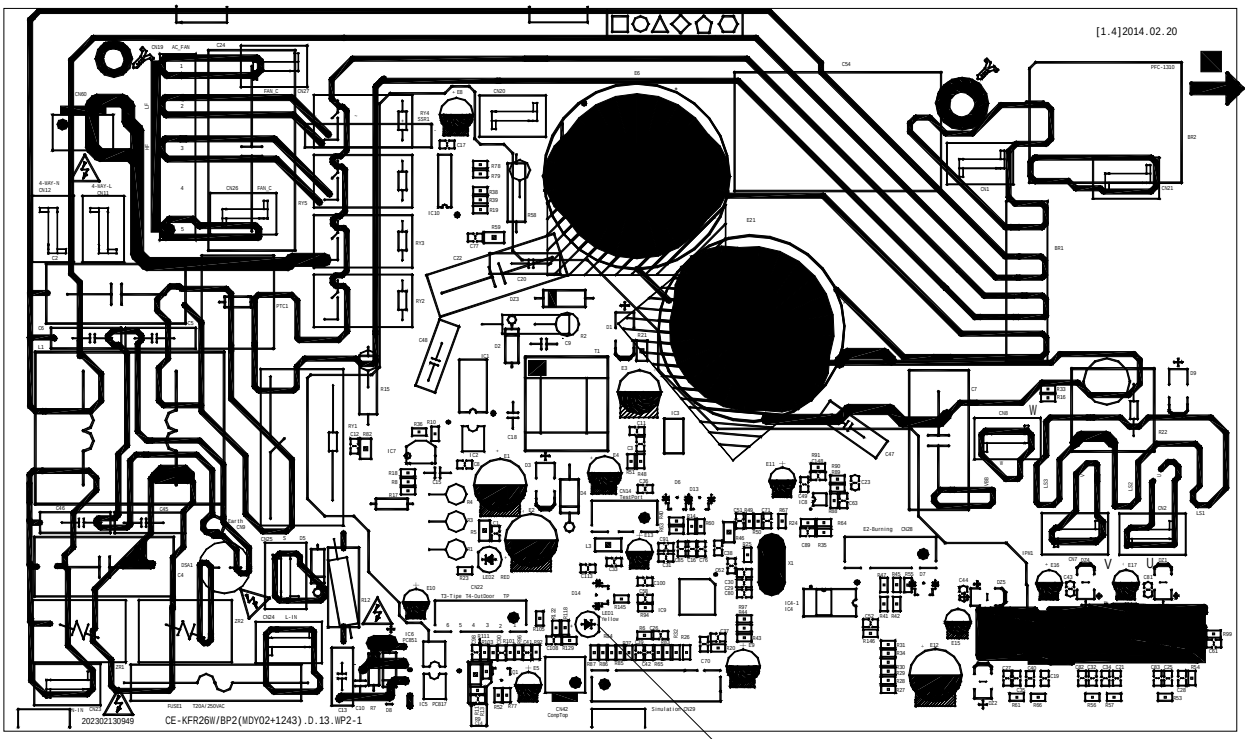
9.1 Indoor Unit Error Display

Operation lamp	Timer lamp	Display	LED STATUS
☆ 1 time	X	E0	Indoor unit EEPROM parameter error
☆ 2 times	X	E1	Indoor / outdoor units communication error
☆ 3 times	X	E2	Zero-crossing signal detection error
☆ 4 times	X	E3	Indoor fan speed has been out of control
☆ 5 times	X	E4	Indoor room temperature sensor T1 open circuit or short circuit
☆ 6 times	X	E5	Evaporator coil temperature sensor T2 open circuit or short circuit
☆ 7 times	X	EC	Refrigerant leakage detection
☆ 1 times	O	F0	Overload current protection
☆ 2 times	O	F1	Outdoor ambient temperature sensor T4 open circuit or short circuit
☆ 3 times	O	F2	Condenser coil temperature sensor T3 open circuit or short circuit
☆ 4 times	O	F3	Compressor discharge temperature sensor T5 open circuit or short circuit
☆ 5 times	O	F4	Outdoor unit EEPROM parameter error
☆ 6 times	O	F5	Outdoor fan speed has been out of control
☆ 1 times	☆	P0	IPM malfunction or IGBT over-strong current protection
☆ 2 times	☆	P1	Over voltage or over low voltage protection
☆ 3 times	☆	P2	High temperature protection of compressor top diagnosis and solution
☆ 5 times	☆	P4	Inverter compressor drive error

O（light） X（off） ☆（flash）

9.2 Outdoor unit error display

MOB1-12CDN1-MP0W,

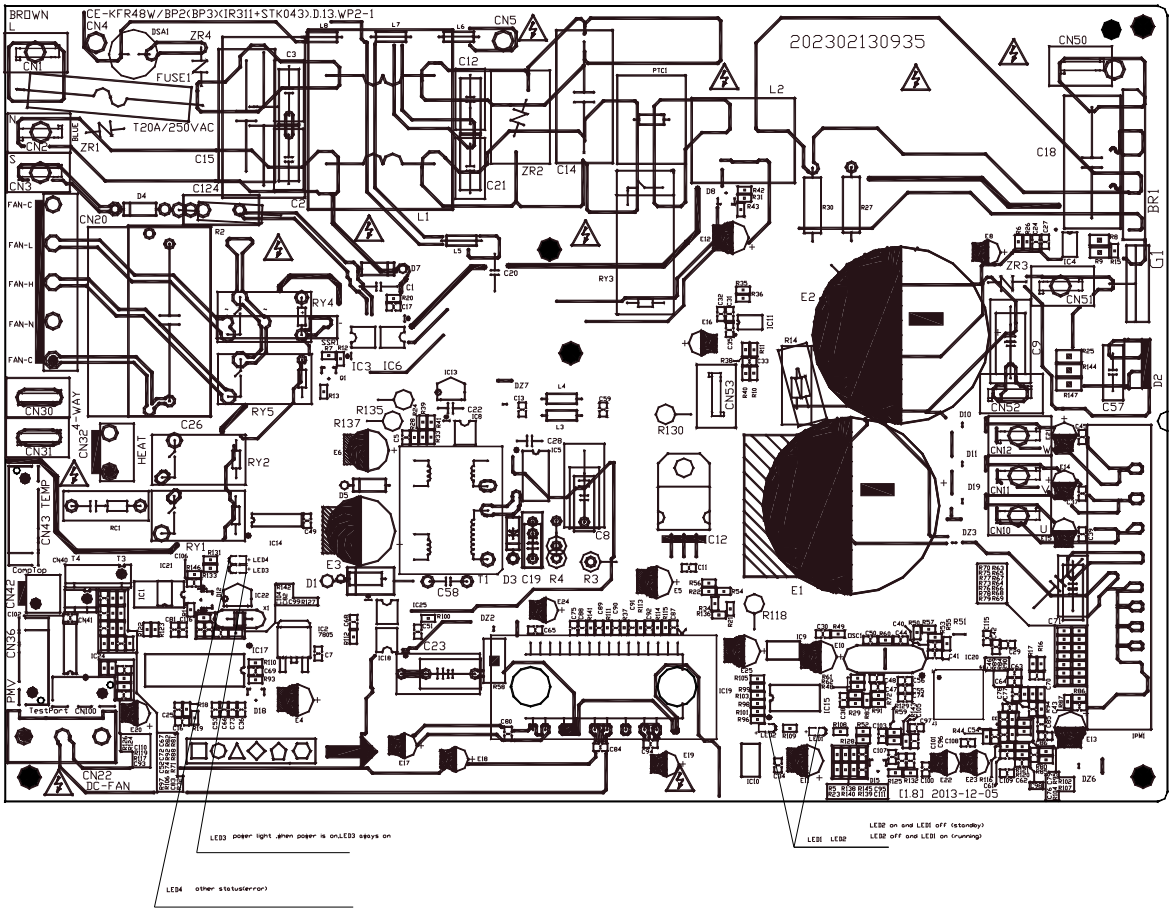


LED1-Yellow

status light, by which you can judge the unit Normal or Error
(standby) Flashing once per second(low speed flashing)

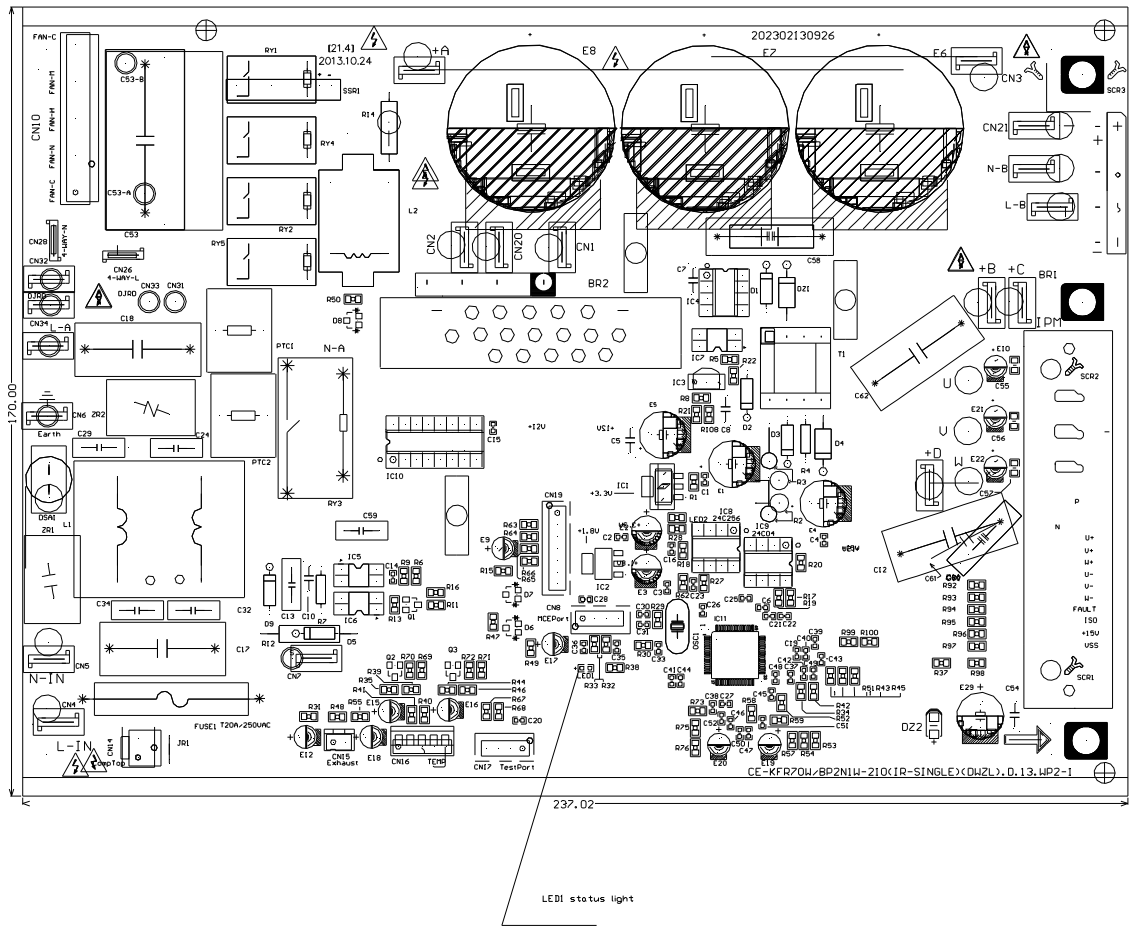
(error) Flashing once per half second (high speed flashing)
(running) aways on

MOC-18CDN1-MP0W



No.	Problems	LED2 (Green)	LED1 (Red)	IU display
1	standby for normal	O	X	
2	Operation normally	X	O	
3	IPM malfunction or IGBT over-strong current protection	☆	X	P0
4	Over voltage or too low voltage protection	O	O	P1
5	Over voltage or too low voltage protection	O	☆	P1
6	Inverter compressor drive error	X	☆	P4
7	Inverter compressor drive error	☆	O	P4
8	Inverter compressor drive error	☆	☆	P4

MOF1-22CDN1-MP5W



9.3 Diagnosis and Solution

9.3.1 EEPROM parameter error diagnosis and solution(E0/F4)

Error Code	**E0/F4**
Malfunction decision conditions	**Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.**
Supposed causes	● **Installation mistake** ● **PCB faulty**

Trouble shooting:

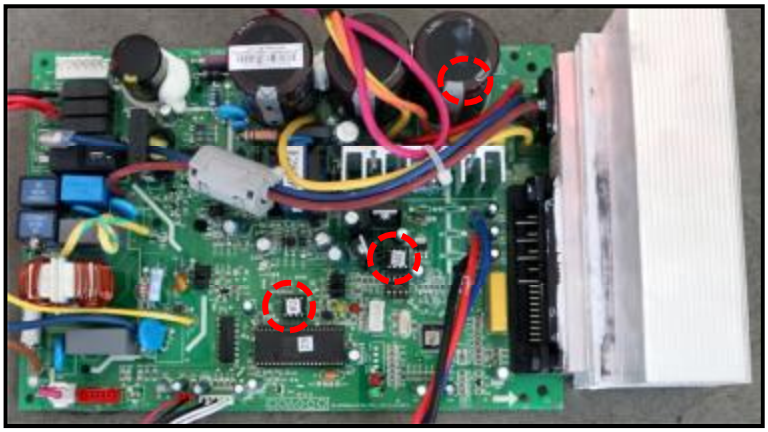
Power off, then restart the unit 2 minutes later.

Yes

Replace the indoor /outdoor main PCB.

EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. For the location of EEPROM chip, please refer to the below photos.

Indoor PCB



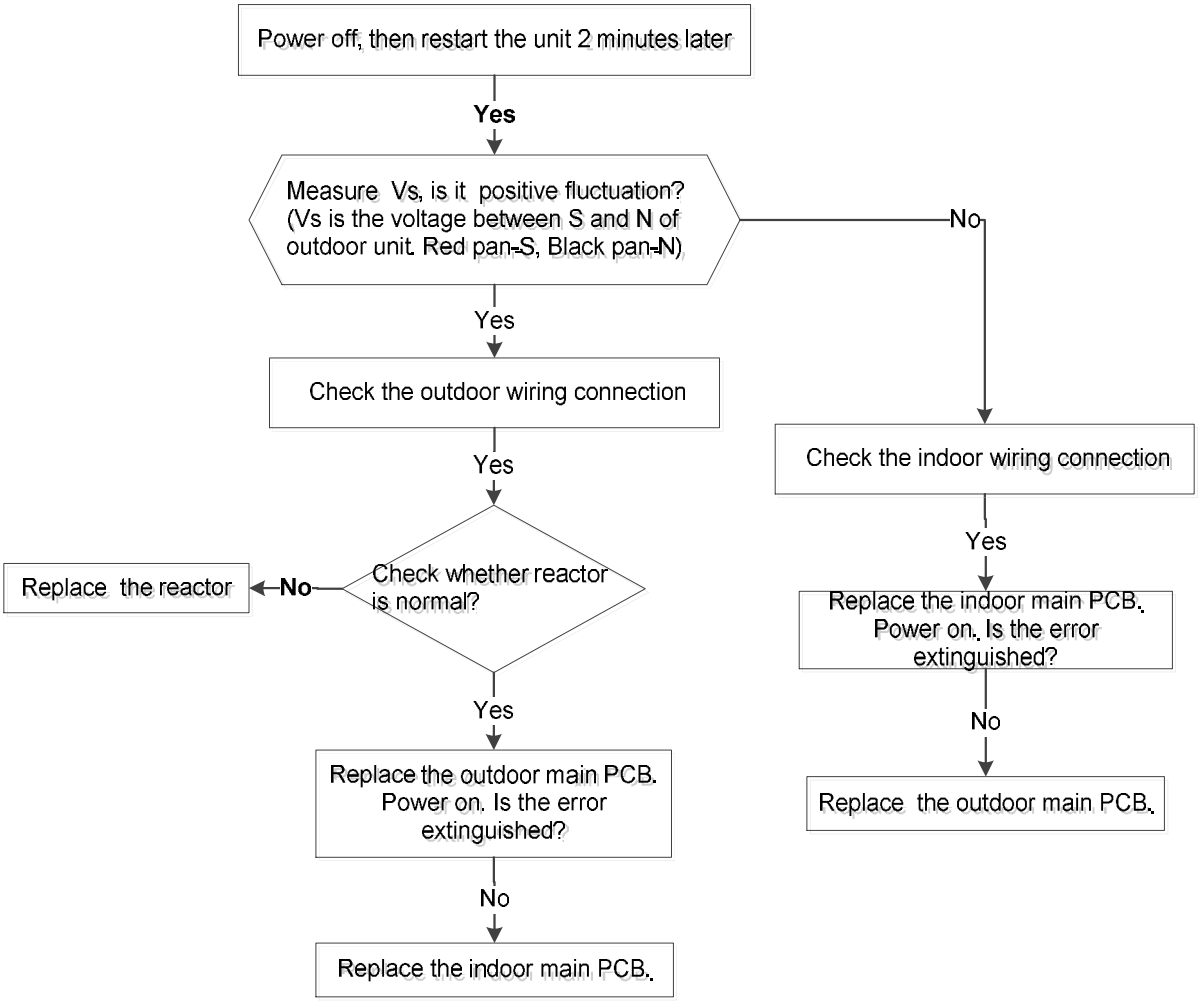
Outdoor PCB(18k model)

Note: The two photos above are only for reference, it's may be not same totally with the ones on your side.

9.3.2 Indoor / outdoor unit's communication diagnosis and solution(E1)

Error Code	**E1**
Malfunction decision conditions	**Indoor unit does not receive the feedback from outdoor unit during 110 seconds and this condition happens four times continuously.**
Supposed causes	• **Wiring mistake** • **Indoor or outdoor PCB faulty**

Trouble shooting:


Power off, then restart the unit 2 minutes later
Yes
Measure Vs, is it positive fluctuation? (Vs is the voltage between S and N of outdoor unit. Red pan-S, Black pan-N)
No
Yes
Check the outdoor wiring connection
Yes
Check whether reactor is normal?
No
Replace the reactor
Yes
Replace the outdoor main PCB. Power on. Is the error extinguished?
No
Replace the indoor main PCB.
Check the indoor wiring connection
Yes
Replace the indoor main PCB. Power on. Is the error extinguished?
No
Replace the outdoor main PCB.

Remark:
Use a multimeter to test the DC voltage between L2 port and S port of outdoor unit. The red pin of multimeter connects with L2 port while the black pin is for S port.

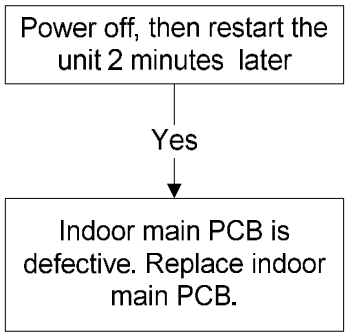
When AC is normal running, the voltage will move alternately between -50V to 50V.

If the outdoor unit has malfunction, the voltage will move alternately with positive value.

While if the indoor unit has malfunction, the voltage will be a certain value.

Remark:
Use a multimeter to test the resistance of the reactor which does not connect with capacitor.
The normal value should be around zero ohm. Otherwise, the reactor must have malfunction and need to be replaced.

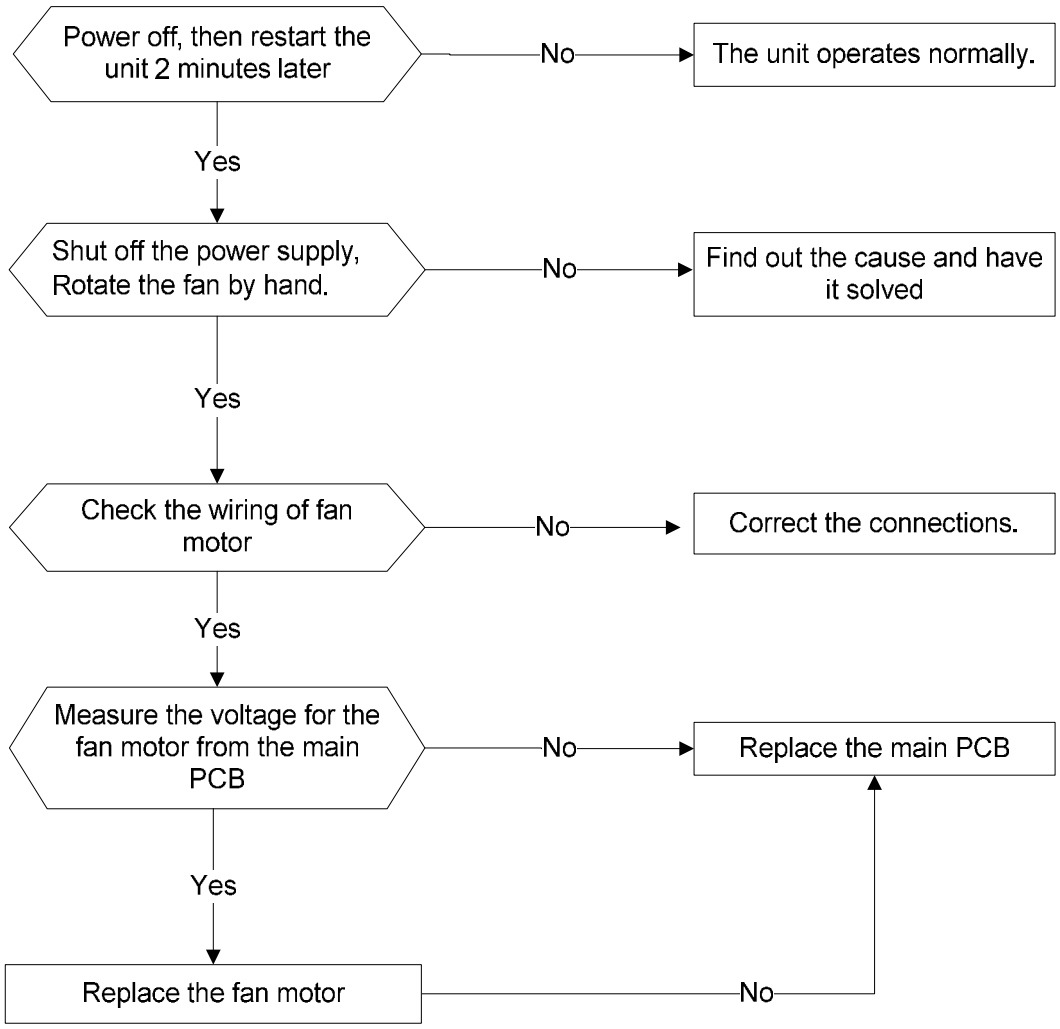
9.2.3 Zero crossing detection error diagnosis and solution（E2）



9.3.4 Fan speed has been out of control diagnosis and solution(E3)

Error Code	**E3/F5**
Malfunction decision conditions	**When indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure.**
Supposed causes	● **Wiring mistake** ● **Fan ass'y faulty** ● **Fan motor faulty** ● **PCB faulty**

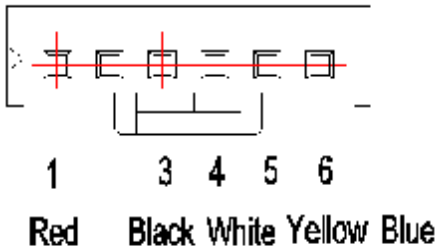
Trouble shooting:



Index 1:

1:Indoor or Outdoor DC Fan Motor(control chip is in fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.



DC motor voltage input and output(voltage: 220-240V~)

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

DC motor voltage input and output(voltage :115V~)

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	140V~190V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

2. Outdoor DC Fan Motor (control chip is in outdoor PCB)

Power on ,and check if the fan can run normally, if the fan can run normally, the PCB must has problems and need to be replaced, If the fan can't run normally, measure the resistance of each two pins. If the resistance is not equal to each other, the fan motor must have problems and need to be replaced, otherwise the PCB must has problems and need to be replaced.

3. Indoor AC Fan Motor

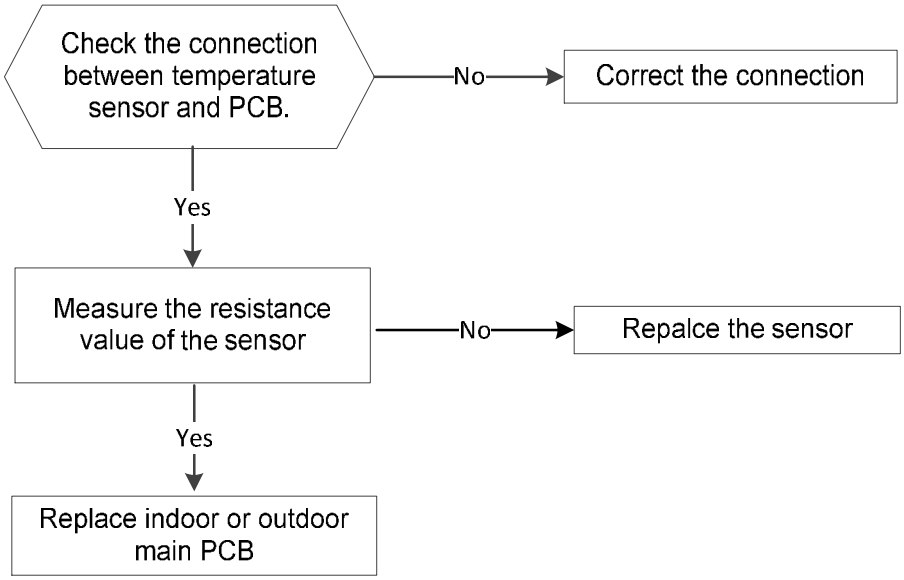
Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power

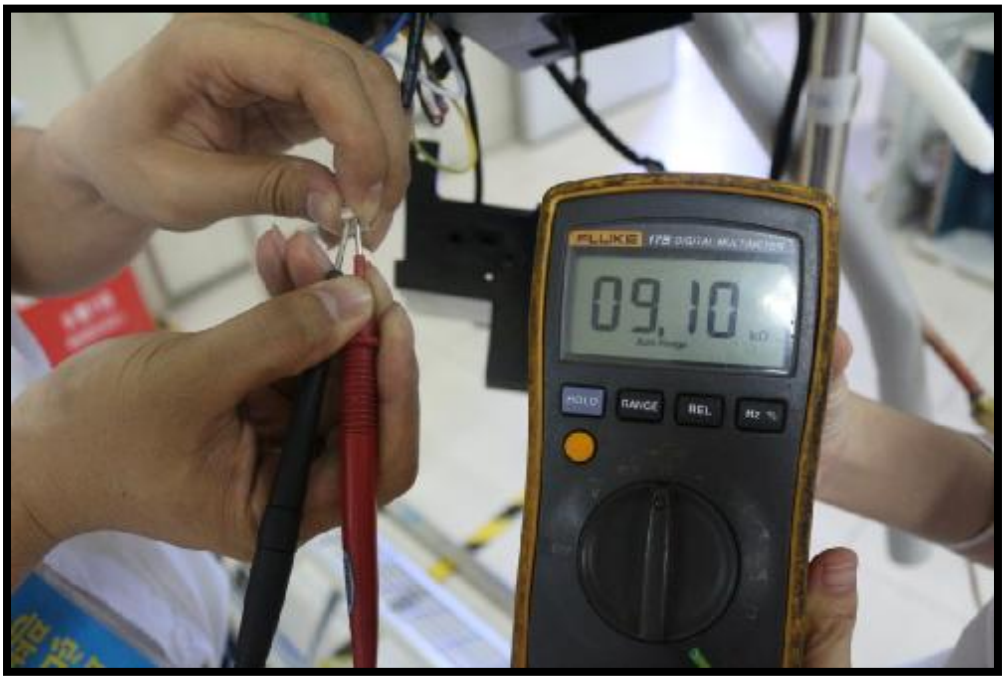
supply)or 50V(115V power supply), the PCB must has problems and need to be replaced.

9.3.5 Open circuit or short circuit of temperature sensor diagnosis and solution(E5)

Error Code	**E4/E5/F1/F2/F3**
Malfunction decision conditions	**If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.**
Supposed causes	• **Wiring mistake** • **Sensor faulty**

Trouble shooting:

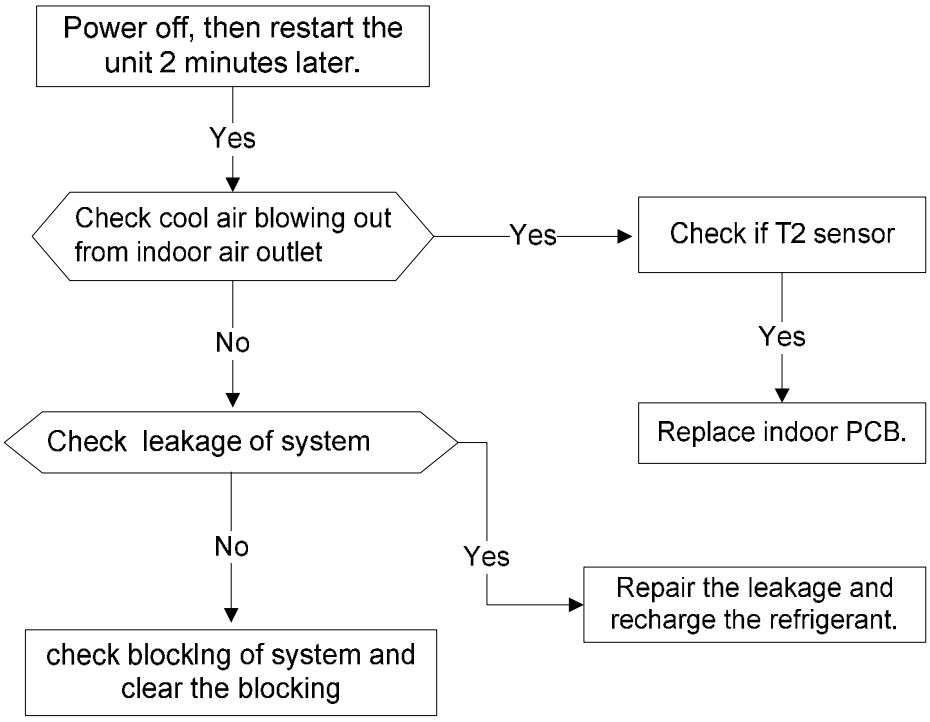




9.3.6 Refrigerant Leakage Detection diagnosis and solution(EC)

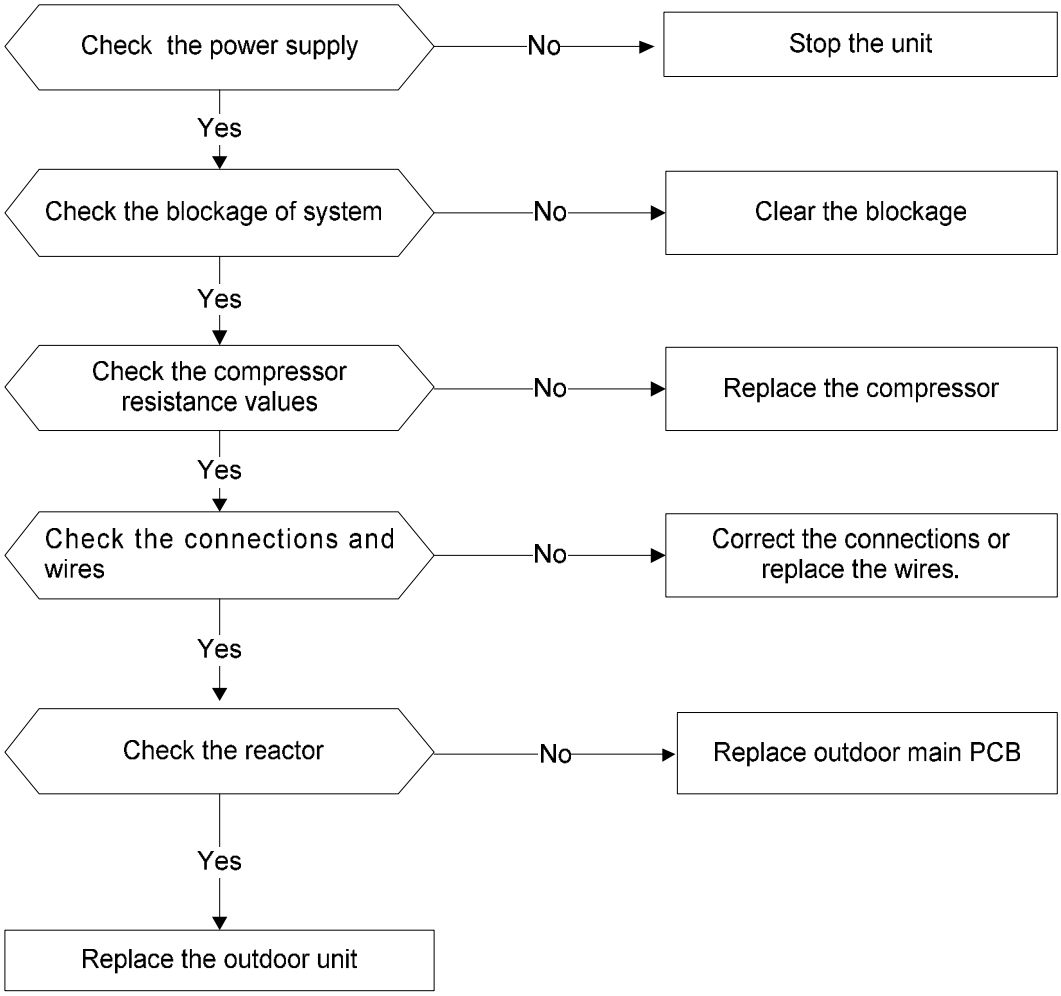
Error Code	EC
Malfunction decision conditions	Define the evaporator coil temp.T2 of the compressor just starts running as Tcool. In the beginning 5 minutes after the compressor starts up, if T2 ＜Tcool－2°C(Tcool－35.6°F) does not keep continuous 4 seconds and this situation happens 3 times, the display area will show “EC” and AC will turn off.
Supposed causes	● T2 sensor faulty ● Indoor PCB faulty ● System problems, such as leakage or blocking.

Trouble shooting:



9.3.7 Overload current protection diagnosis and solution(F0)

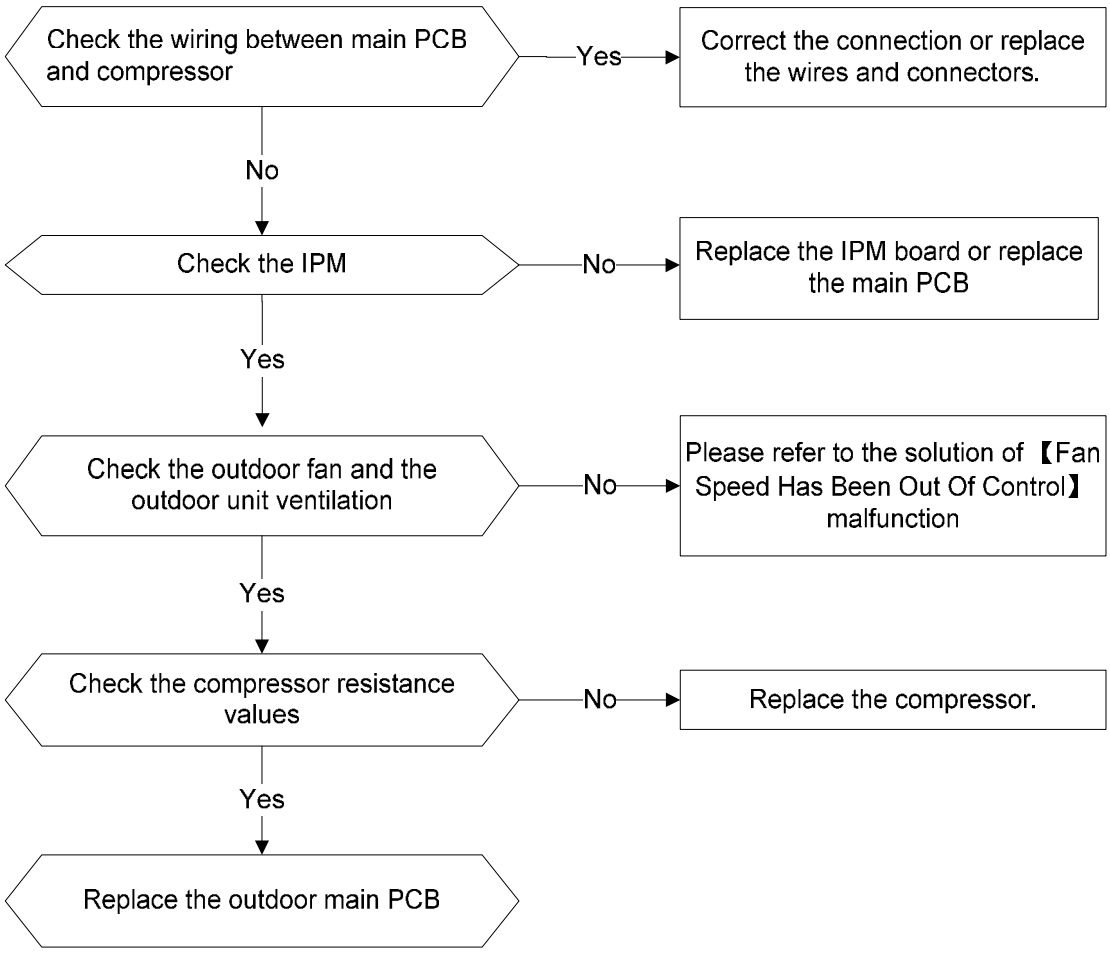
Error Code	F0
Malfunction decision conditions	An abnormal current rise is detected by checking the specified current detection circuit.
Supposed causes	• Power supply problems. • System blockage • PCB faulty • Wiring mistake • Compressor malfunction



9.3.8 IPM malfunction or IGBT over-strong current protection diagnosis and solution(P0)

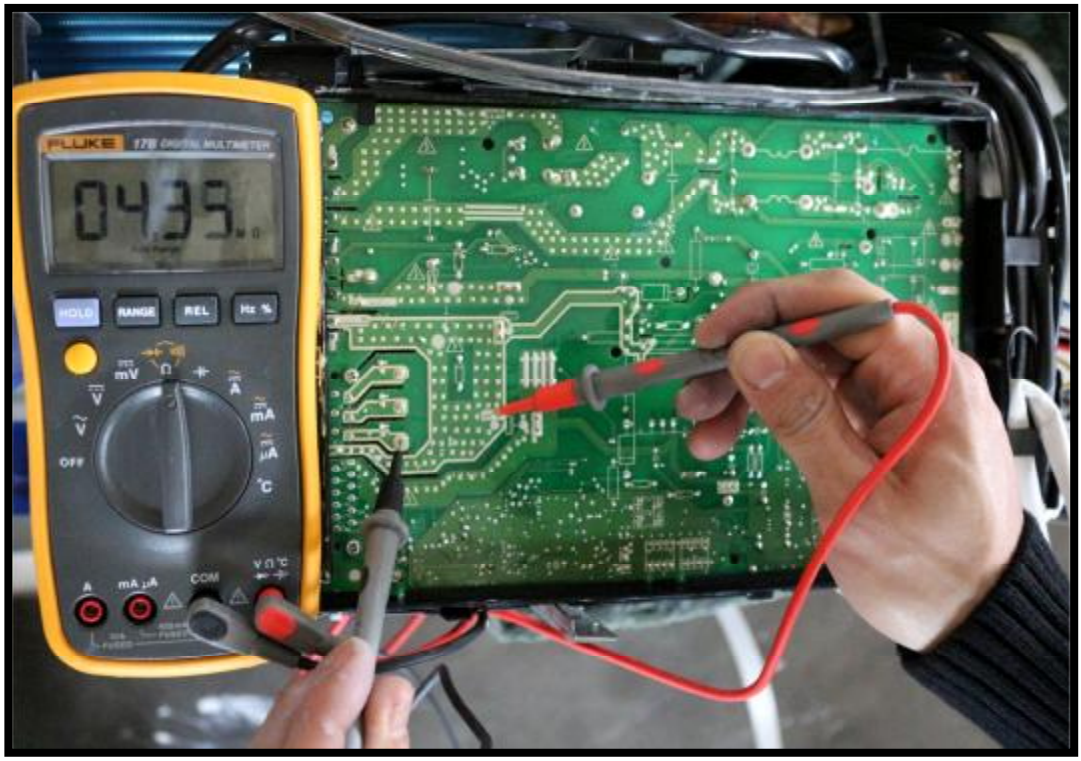
Error Code	**P0**
Malfunction decision conditions	**When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show "P0" and AC will turn off.**
Supposed causes	● **Wiring mistake** ● **IPM malfunction** ● **Outdoor fan ass'y faulty** ● **Compressor malfunction** ● **Outdoor PCB faulty**

Trouble shooting:

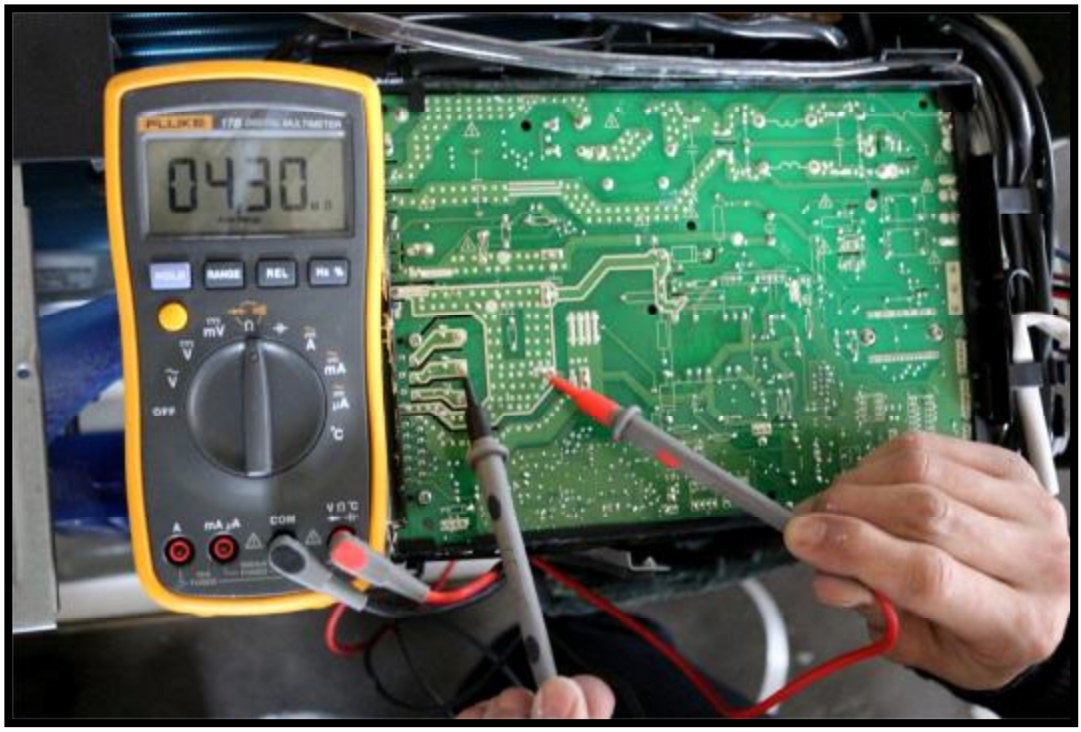

Check the wiring between main PCB and compressor
Yes
Correct the connection or replace the wires and connectors.
No
Check the IPM
No
Replace the IPM board or replace the main PCB
Yes
Check the outdoor fan and the outdoor unit ventilation
No
Please refer to the solution of 【Fan Speed Has Been Out Of Control】 malfunction
Yes
Check the compressor resistance values
No
Replace the compressor.
Yes
Replace the outdoor main PCB

For example:

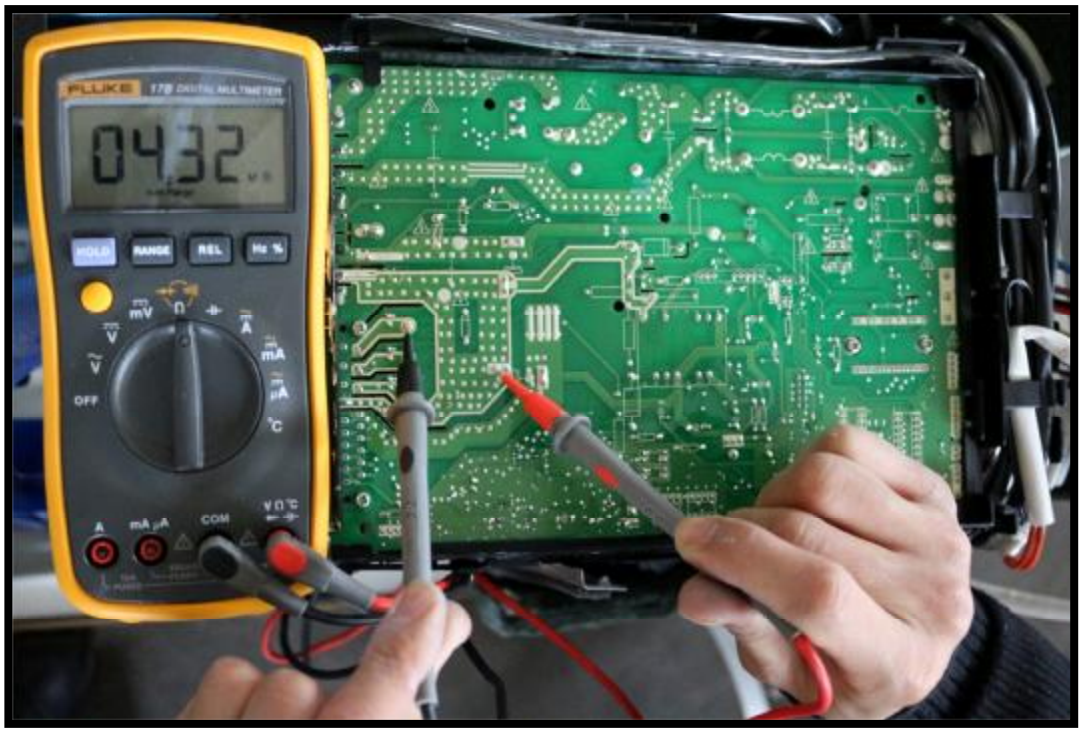
Note: The photos below are only for reference, it's may be not same totally with the ones on your side.



P-U



P-V


FLUKE
17B DIGITAL MULTIMETER
0432
HOLD
RANGE
REL
Hz %
mV
Ω
A
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mA
µA
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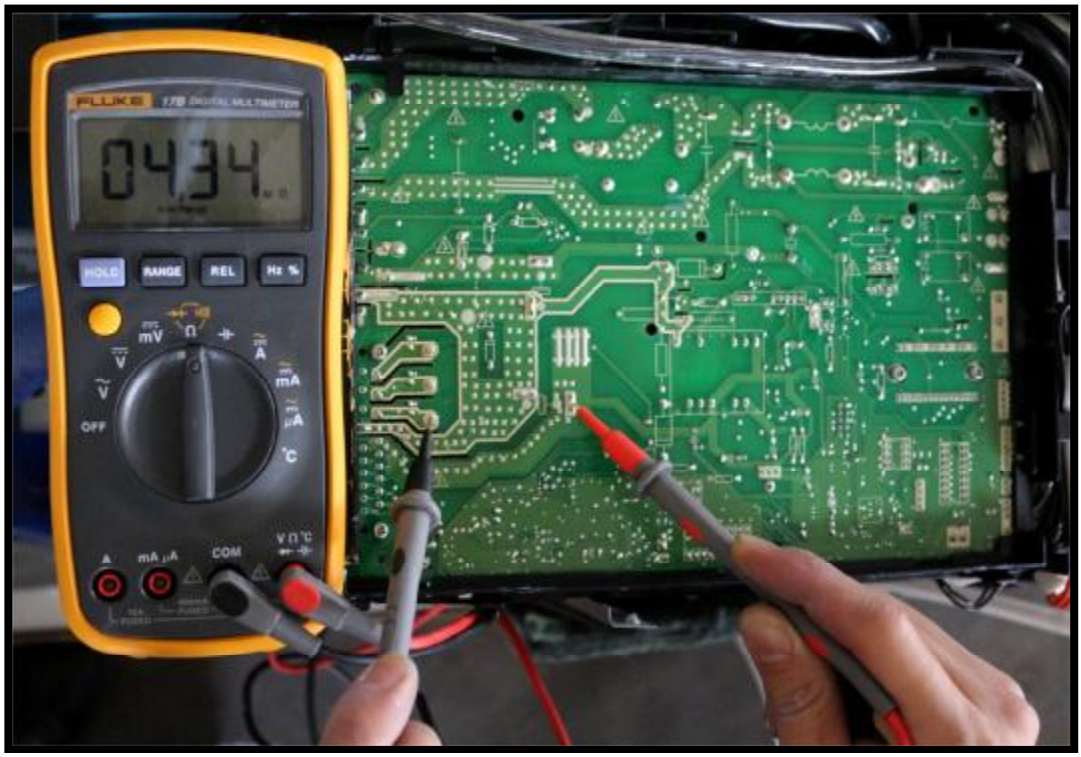
COM
V Ω °C

P-W


FLUKE
17B DIGITAL MULTIMETER
0434
HOLD
RANGE
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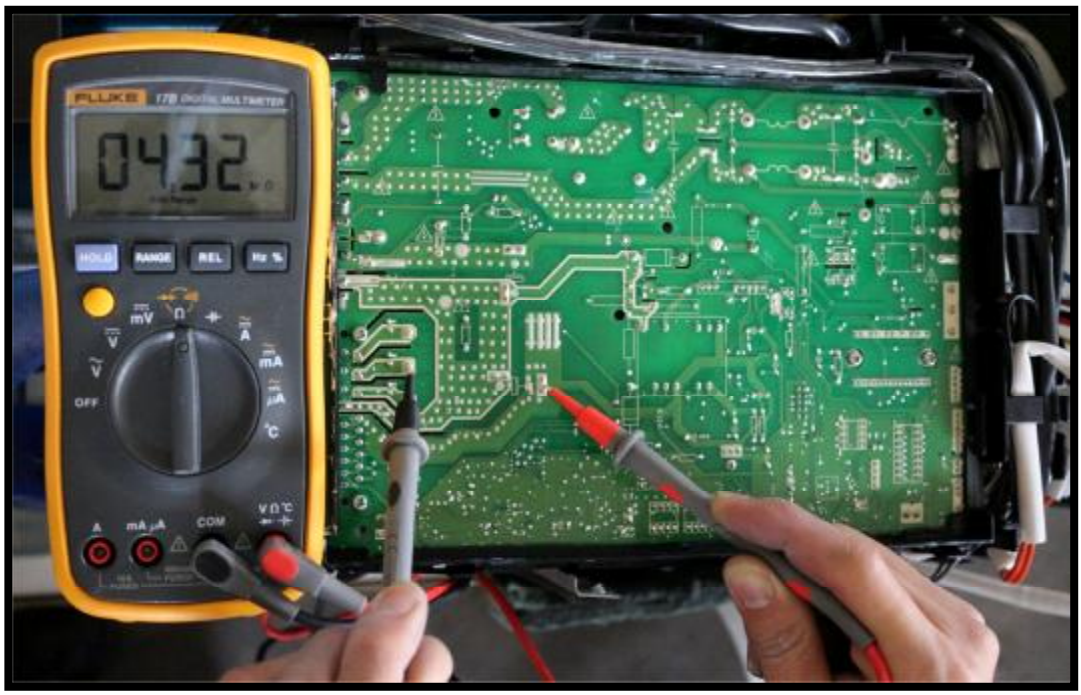
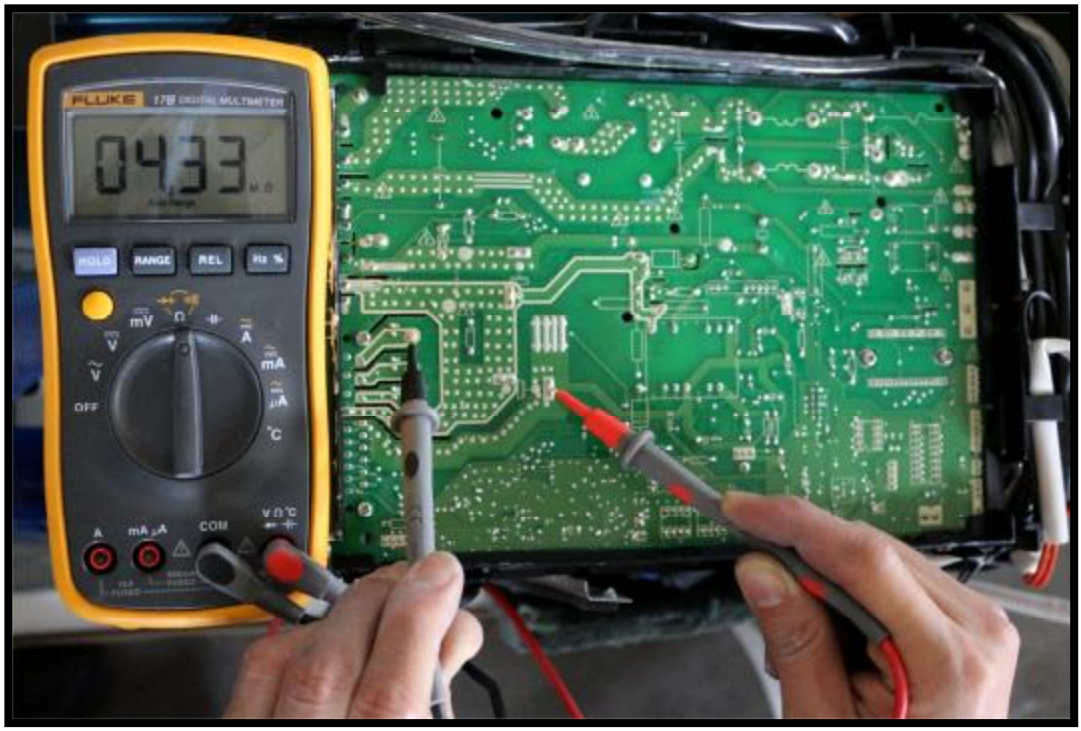
COM
V Ω °C

N-U


FLUKE
0432
HOLD
RANGE
REL
Hz %
OFF
COM

N-V

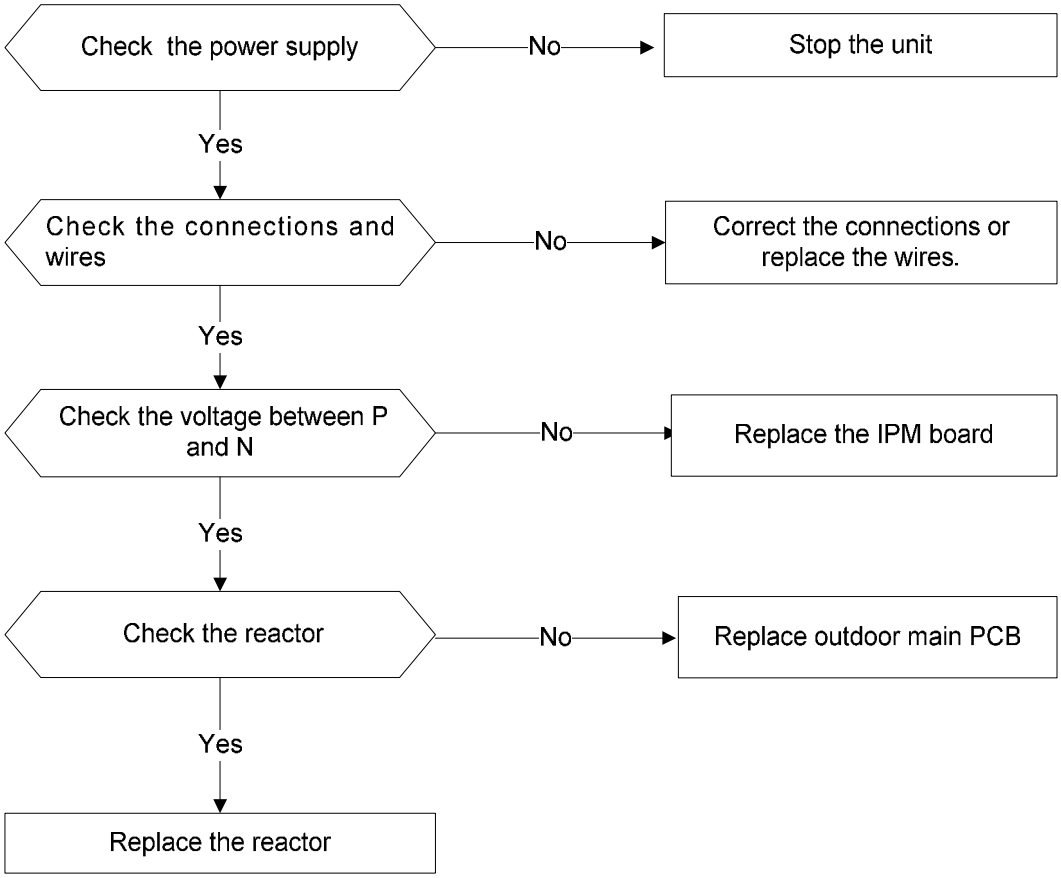

FLUKE
0433
HOLD
RANGE
REL
Hz %
OFF
COM

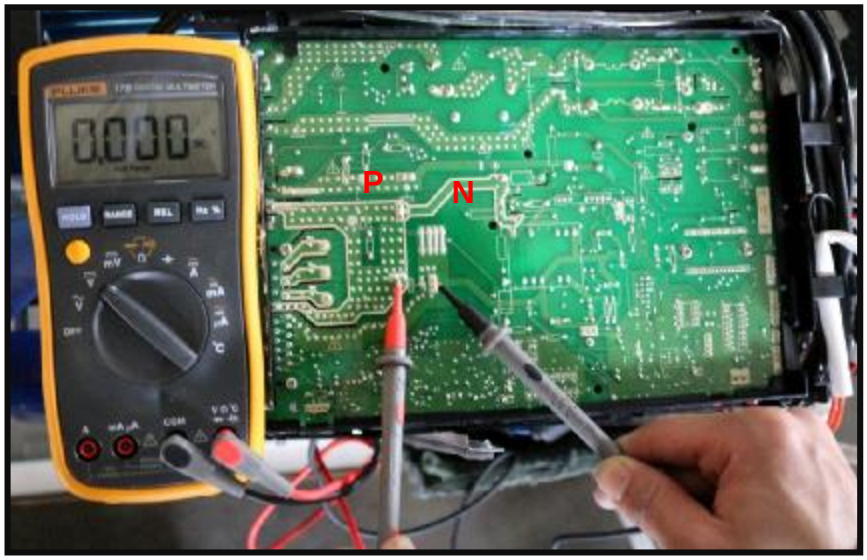
N-W

9.3.9 Over voltage or too low voltage protection diagnosis and solution(P1)

Error Code	P1
Malfunction decision conditions	An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.
Supposed causes	• Power supply problems. • System leakage or block • PCB faulty

Trouble shooting:



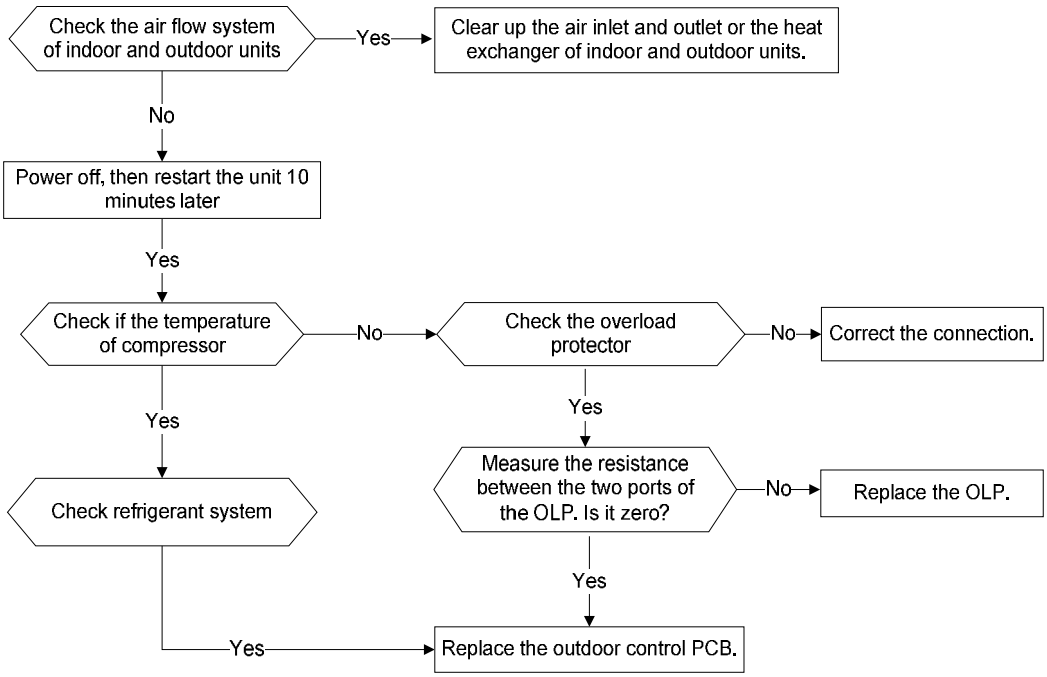


Remark:
Measure the DC voltage between P and N port. The normal value should be around 310V.

9.3.10 High temperature protection of compressor top diagnosis and solution(P2)

Error Code	**P2**
Malfunction decision conditions	**If the sampling voltage is not 5V, the LED will display the failure.**
Supposed causes	● **Power supply problems.** ● **System leakage or block** ● **PCB faulty**

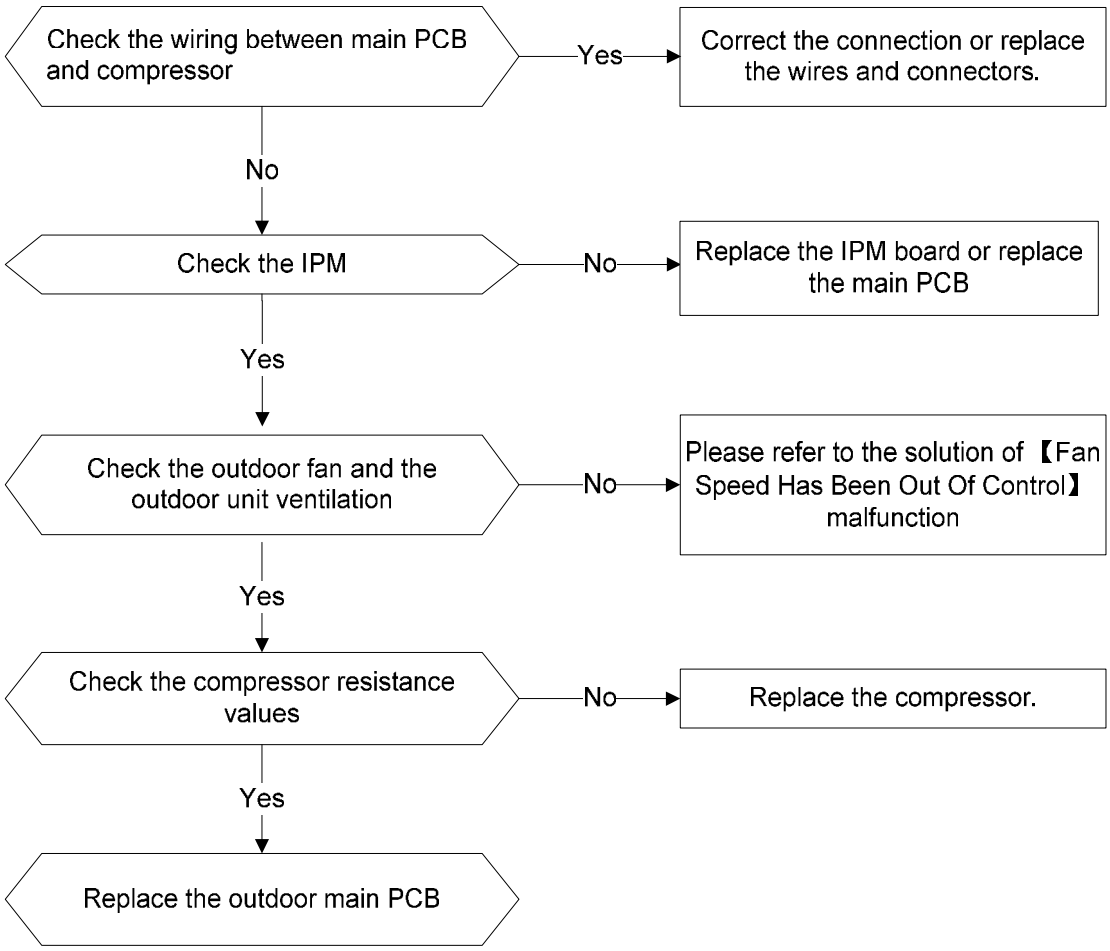
Trouble shooting:


Check the air flow system of indoor and outdoor units
Yes
Clear up the air inlet and outlet or the heat exchanger of indoor and outdoor units.
No
Power off, then restart the unit 10 minutes later
Yes
Check if the temperature of compressor
No
Check the overload protector
No
Correct the connection.
Yes
Yes
Measure the resistance between the two ports of the OLP. Is it zero?
No
Replace the OLP.
Check refrigerant system
Yes
Yes
Replace the outdoor control PCB.

9.3.11 Inverter compressor drive error diagnosis and solution(P4)

Error Code	P4
Malfunction decision conditions	An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.
Supposed causes	● Wiring mistake ● IPM malfunction ● Outdoor fan ass'y faulty ● Compressor malfunction ● Outdoor PCB faulty

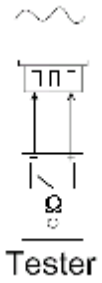
Trouble shooting:


Check the wiring between main PCB and compressor
Yes
Correct the connection or replace the wires and connectors.
No
Check the IPM
No
Replace the IPM board or replace the main PCB
Yes
Check the outdoor fan and the outdoor unit ventilation
No
Please refer to the solution of【Fan Speed Has Been Out Of Control】malfunction
Yes
Check the compressor resistance values
No
Replace the compressor.
Yes
Replace the outdoor main PCB

Main parts check

1. Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Temperature sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

Appendix 1 Temperature Sensor Resistance Value Table for T1,T2,T3,T4 (°C--K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.83003	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.0898	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.38703	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.34105	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.1988	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.44677	99	210	0.64862	139	282	0.22231

Appendix 2 Temperature Sensor Resistance Value Table for T5 (°C --K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.717
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	16.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

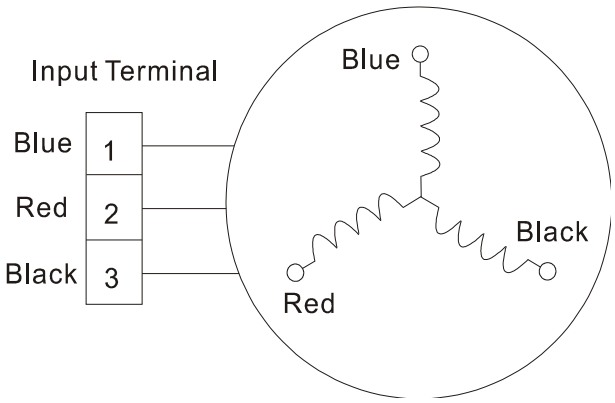
Appendix 3:

$$\Delta T(°F) = \frac{9\Delta T(°C)}{5}$$

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-5	23	21	69.8	51	123.8	82	179.6	113	235.4
-4	24.8	22	71.6	52	125.6	83	181.4	114	237.2
-3	26.6	23	73.4	53	127.4	84	183.2	115	239
-2	28.4	24	75.2	54	129.2	85	185	116	240.8
-1	30.2	25	77	55	131	86	186.8	117	242.6
0	32	25.5	77.9	56	132.8	87	188.6	118	244.4
0.5	32.9	26	78.8	57	134.6	88	190.4	119	246.2
1	33.8	27	80.6	58	136.4	89	192.2	120	248
1.5	34.7	28	82.4	59	138.2	90	194	121	249.8
2	35.6	29	84.2	60	140	91	195.8	122	251.6
2.5	36.5	30	86	61	141.8	92	197.6	123	253.4
3	37.4	31	87.8	62	143.6	93	199.4	124	255.2
3.5	38.3	32	89.6	63	145.4	94	201.2	125	257
4	39.2	33	91.4	64	147.2	95	203	126	258.8
4.5	40.1	34	93.2	65	149	96	204.8	127	260.6
5	41	35	95	66	150.8	97	206.6	128	262.4
6	42.8	36	96.8	67	152.6	98	208.4	129	264.2
7	44.6	37	98.6	68	154.4	99	210.2	130	266
8	46.4	38	100.4	69	156.2	100	212	131	267.8
9	48.2	39	102.2	70	158	101	213.8	132	269.6
10	50	40	104	71	159.8	102	215.6	133	271.4
11	51.8	41	105.8	72	161.6	103	217.4	134	273.2
12	53.6	42	107.6	73	163.4	104	219.2	135	275
13	55.4	43	109.4	74	165.2	105	221	136	276.8
14	57.2	44	111.2	75	167	106	222.8	137	278.6
15	59	45	113	76	168.8	107	224.6	138	280.4
16	60.8	46	114.8	77	170.6	108	226.4	139	282.2
17	62.6	47	116.6	78	172.4	109	228.2	140	284
18	64.4	48	118.4	79	174.2	110	230	141	285.8
19	66.2	49	120.2	80	176	111	231.8	142	287.6
20	68	50	122	81	177.8	112	233.6	143	289.4

2.Compressor checking

Measure the resistance value of each winding by using the tester.



Position	Resistance Value		
	ASN98D22UEZ	ASM135D23UFZ	DA150S1C-20FZ(F)
Blue - Red	1.57Ω (20℃/68℉)	1.75Ω (20℃/68℉)	0.95Ω (20℃/68℉)
Blue - Black			
Red - Blue			

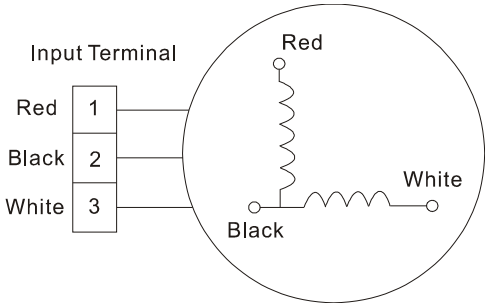
3. IPM continuity check

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

Digital tester		Normal resistance value	Digital tester		Normal resistance value
(+)Red	(-)Black		(+)Red	(-)Black	
P	N	∞ (Several MΩ)	U	N	∞ (Several MΩ)
	U		V		
	V		W		
	W		(+)Red		

4.Indoor AC Fan Motor

Measure the resistance value of each winding by using the tester.



Position	Resistance Value		
	RPG20E(YKFG-20-4-5)	RPG28D(YKFG-28-4-1)	RPG45C(YKFG-45-4-22)
Black - Red	388Ω±8% (20℃) (Brand: Weiling)	260Ω±8% (20℃) (Brand: Weiling)	168Ω±8% (20℃) (Brand: Weiling)
White - Black	360Ω±8% (20℃) (Brand: Weiling)	385Ω±8% (20℃) (Brand: Weiling)	141Ω±8% (20℃) (Brand: Weiling)

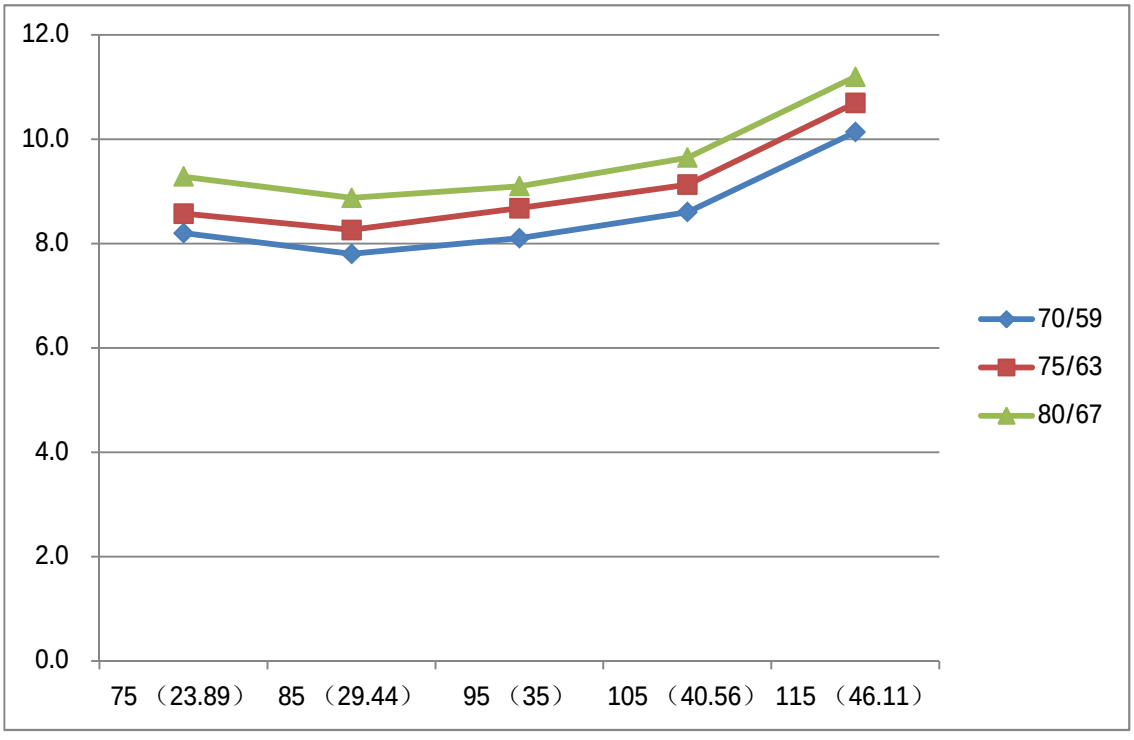
5: Pressure On Service Port

Cooling chart:

°F(°C)	ODT / IDT	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)
BAR	70/59	8.2	7.8	8.1	8.6	10.1
BAR	75/63	8.6	8.3	8.7	9.1	10.7
BAR	80/67	9.3	8.9	9.1	9.6	11.2

°F(°C)	ODT / IDT	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)
PSI	70/59	119	113	117	125	147
PSI	75/63	124	120	126	132	155
PSI	80/67	135	129	132	140	162

°F(°C)	ODT / IDT	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)
MPA	70/59	0.82	0.78	0.81	0.86	1.01
MPA	75/63	0.86	0.83	0.87	0.91	1.07
MPA	80/67	0.93	0.89	0.91	0.96	1.12

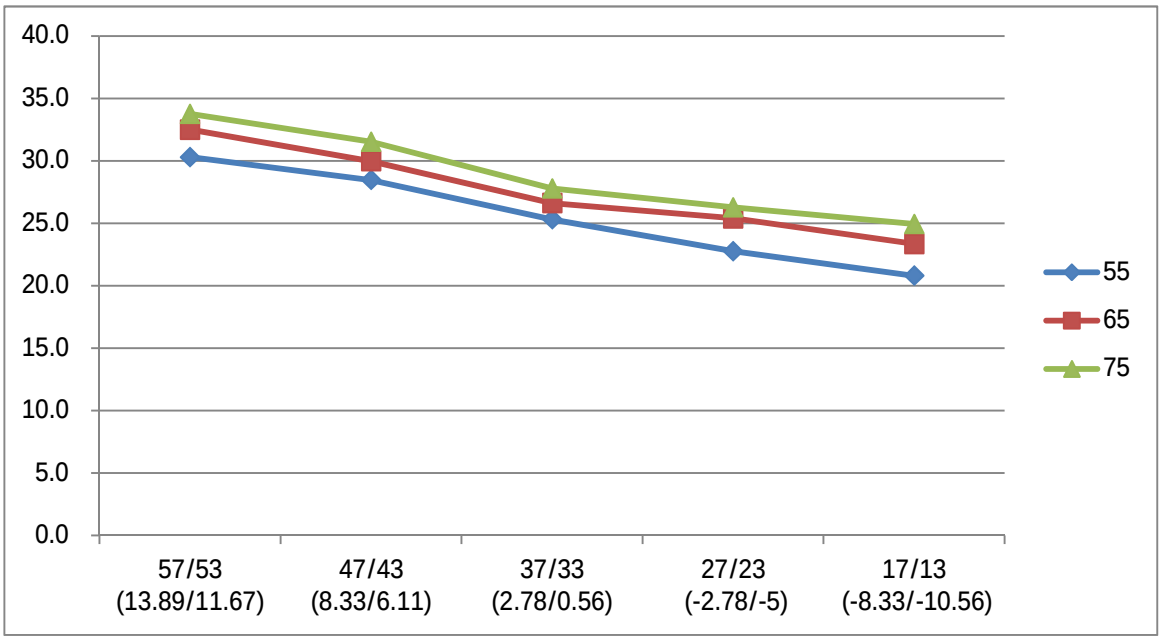


Heating Chart:

°F (°C)	ODT / IDT	57/53 (13.89/11.67)	47/43 (8.33/6.11)	37/33 (2.78/0.56)	27/23 (-2.78/-5)	17/13 (-8.33/-10.56)
BAR	55	30.3	28.5	25.3	22.8	20.8
BAR	65	32.5	30.0	26.6	25.4	23.3
BAR	75	33.8	31.5	27.8	26.3	24.9

°F (°C)	ODT / IDT	57/53 (13.89/11.67)	47/43 (8.33/6.11)	37/33 (2.78/0.56)	27/23 (-2.78/-5)	17/13 (-8.33/-10.56)
PSI	55	439	413	367	330	302
PSI	65	471	435	386	368	339
PSI	75	489	457	403	381	362

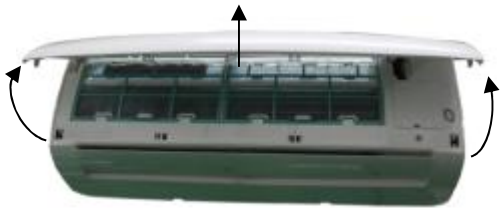
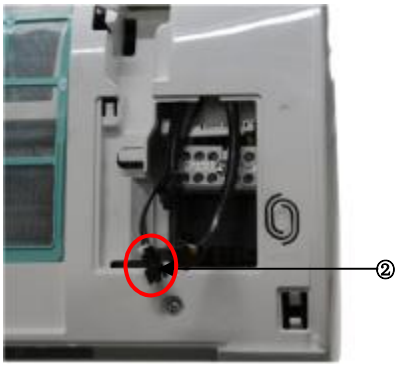
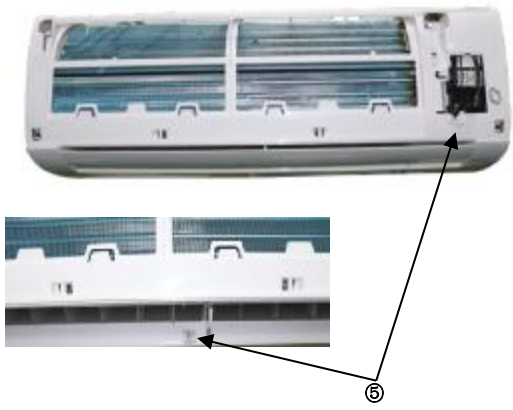
°F (°C)	ODT / IDT	57/53 (13.89/11.67)	47/43 (8.33/6.11)	37/33 (2.78/0.56)	27/23 (-2.78/-5)	17/13 (-8.33/-10.56)
MPA	55	3.03	2.85	2.53	2.28	2.08
MPA	65	3.25	3.00	2.66	2.54	2.33
MPA	75	3.38	3.15	2.78	2.63	2.49

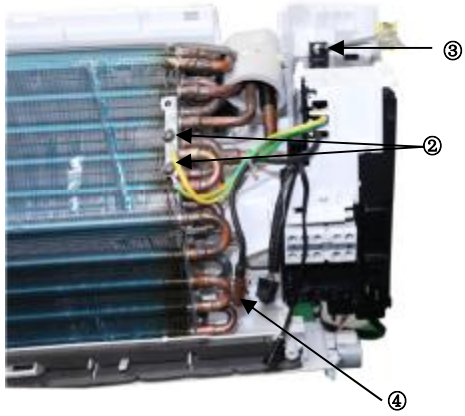
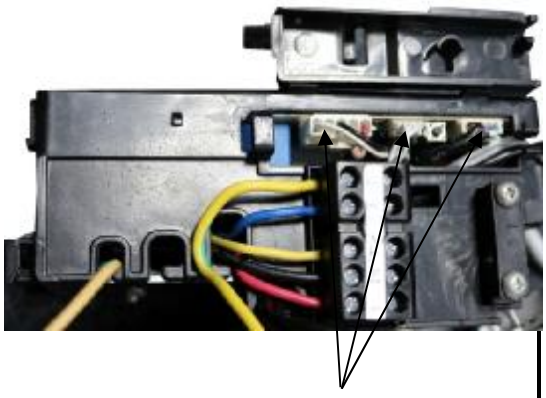


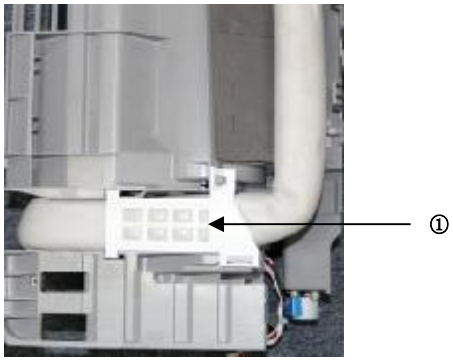
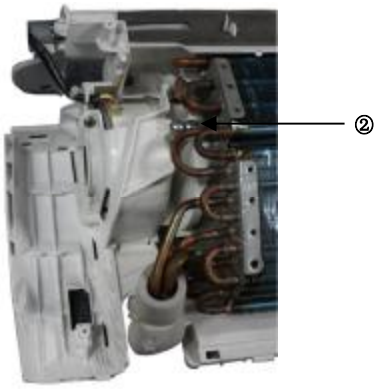
10 Disassembly Instructions

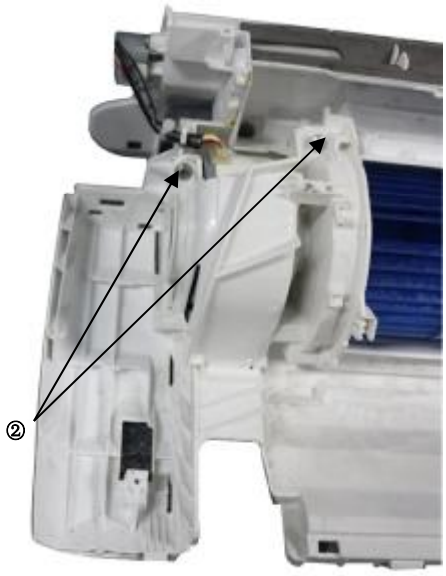
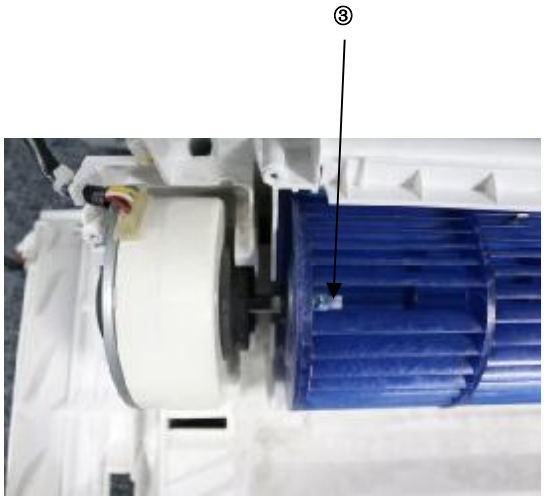
Note: This part is for reference, the photos may have slight difference with your machine.

10.1 Indoor unit

No.	Parts name	Procedures	Remarks
1	Front panel	How to remove the front panel. 1) Pull the below side of the panel toward you and remove the cover 2) Release the connector of the display ass'y. 3) Release the two clips and then remove the panel. 4) Remove the filter and the horizontal louver. 5) Remove the two screws and then remove the panel ass'y.	  

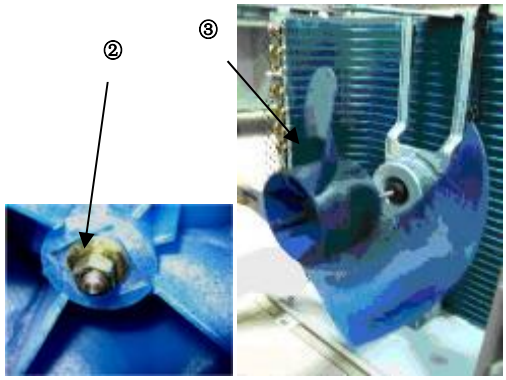
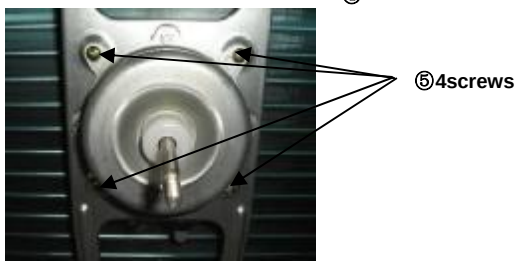
2	Electrical parts	How to remove the electrical parts. 1) Remove the front panel from procedure 1. 2) Pull out the room temp. sensor (T1). Remove the two screws for the ground connection. 3) Remove the fixing screw. 4) Pull out the coil temp. sensor. 5) From the side direction, open the electronic control box cover fixing by clips. Pull out the fan motor connector and swing motor connector. Then remove the electronic control box.	  

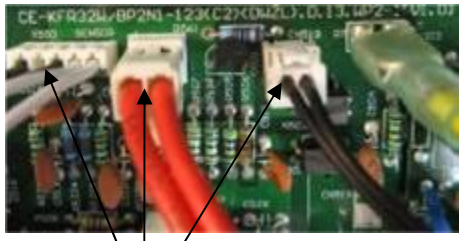
3	Evaporator	How to remove the evaporator. 1) After remove the electrical parts from procedure 2, disassemble the pipe holder at the rear side of the unit. . 2) Remove the screws on the evaporator at the fixed plate. 3) Remove the two screws on the evaporator at the base bearing side. 4) Then pull out the evaporator.	 

4	Fan motor and Fan	How to remove the fan motor. 1) Remove the front panel, electrical parts and evaporator following procedure 1-3. 2) Remove the two screws and remove the fixing board of fan motor. 3) Remove the fixing screw . 4) Pull out the fan motor and fan ass'y from the side direction.	 

10.2 Outdoor unit

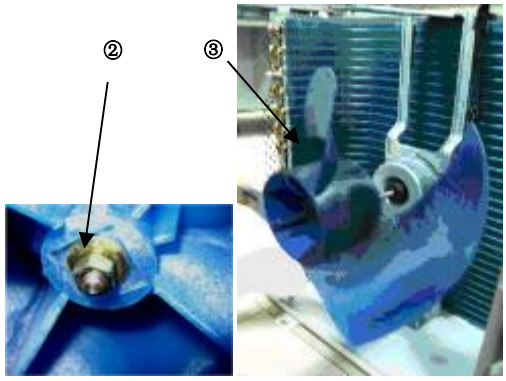
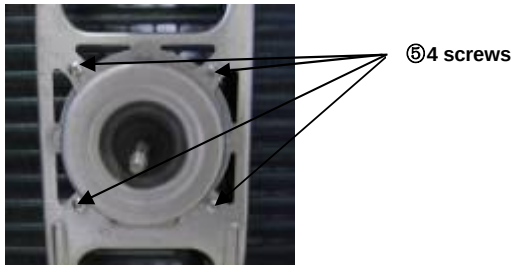
Ø MOB1-12CDN1-MP0W

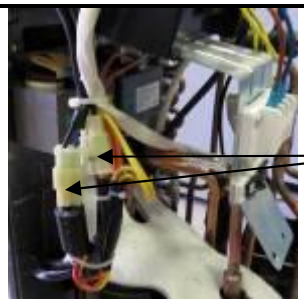
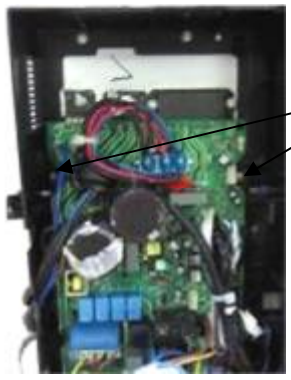
No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the top cover.(8 screws) 3) Remove the front panel.(10 screws) 4) Remove the side panel.(11 screws)	
2	Fan ass’y	How to remove the fan ass’y. 1) Remove the panel plate from procedure 1 2) Remove the hex nut fixing the fan. 3) Remove the fan. 4) Disconnect the connector for fan motor from the electronic control board. 5) Remove the fixing screws.(4 pcs) 6) Remove the fan motor.	 

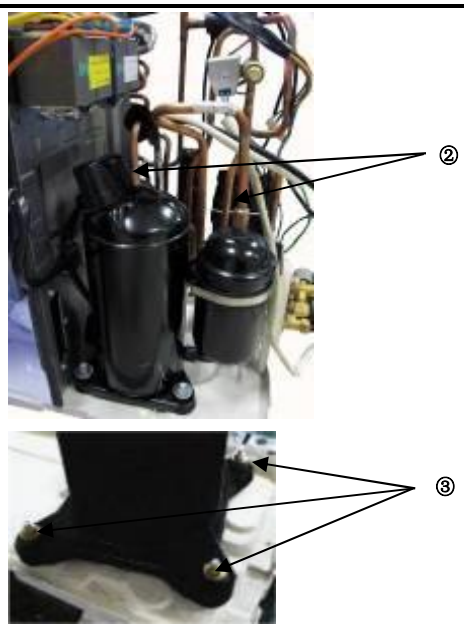
3	Electrical parts	How to remove the electrical parts. 1) Perform work of item 1,2. 2) Remove the wires connected with the compressor. (On the IPM) 3) Remove the wires connected with 4-way valve. 4) Remove the red wire connected with the capacitor Remove the blue wire connected with the reactor. 5) Remove the temp. sensor connectors. Remove the ground wire of the compressor 6) Remove the two fixing screws 7) Remove the electronic control box.	 ② ③ **Two blue wires** ④  ⑤ ⑥ ⑦
4	Compressor	How to remove the	

		compressor. 1) Perform work of item 1,2,3. 2) Remove ground wire and remove the discharge pipe and suction pipe with a burner. 3) Remove the nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	

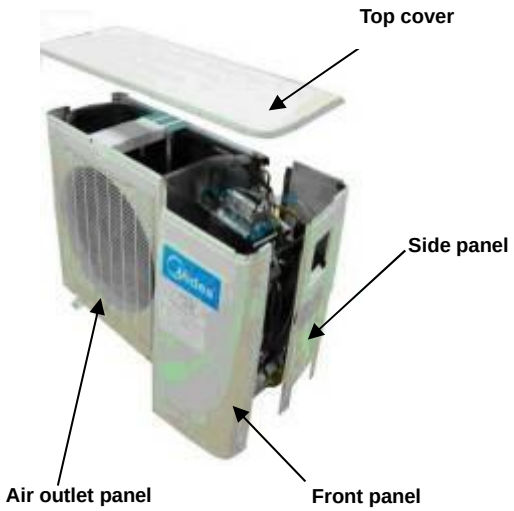
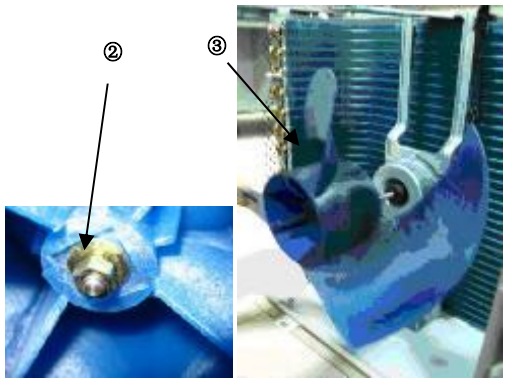
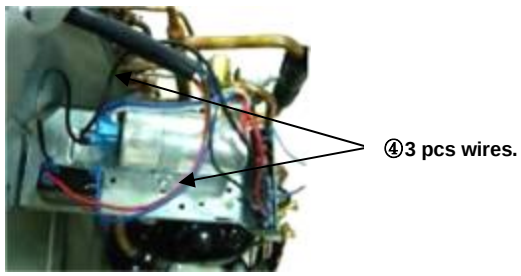
Ø MOC-18CDN1-MP0W

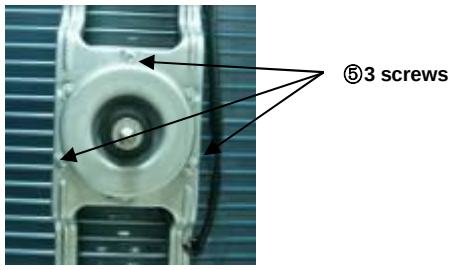
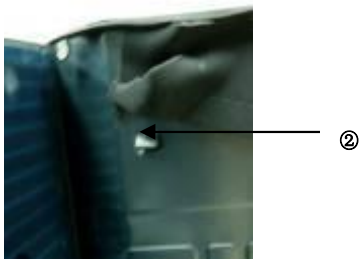
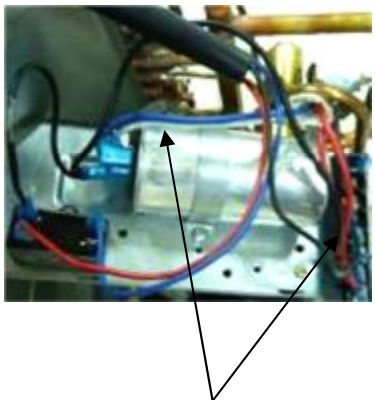
No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the top cover.(6 screws) 3) Remove the front panel.(10 screws) 4) Remove the side panel.(10 screws)	
2	Fan ass’y	How to remove the fan ass’y. 1) Remove the panel plate from procedure 1 2) Remove the hex nut fixing the fan. 3) Remove the fan. 4) Disconnect the connector for fan motor from the electronic control board. 5) Remove the fixing screws.(4 pcs) 6) Remove the fan motor.	 
3	Electrical parts	How to remove the electrical	

		parts. 1) Perform work of item 1,2. 2) Remove the two connectors for the compressor and the reactors. 3) Remove two blue wires connected with the four way valve. 4) Remove the connectors for the condenser coil temp. sensor(T3),outdoor ambient temp. sensor(T4) and discharge temp. sensor(T5). (two black connectors, one white connector) 5) Remove the ground wires . 6) Remove the fixing screws. 7) Remove the electronic control box.	 ② ③ ④ T3,T4,T5 ⑤  ⑥ two screws
4	Compressor	How to remove the compressor.	

		1) Perform work of item 1,2,3. 2) Remove the ground wire and remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	

Ø MOF1-22CDN1-MP5W

No.	Parts name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the top cover.(9 screws) 3) Remove the front panel.(2 screws) 4) Remove the side panel.(10 screws) 5) Remove the air outlet panel.(9 screws)	
2	Fan ass’y	How to remove the fan ass’y. 1) Remove the panel plate from procedure 1. 2) Remove the hex nut fixing the fan. 3) Remove the fan. 4) Disconnect the connectors for fan motor from the electronic control board. (There are blue wire, red wire and black wire. The blue wire and red wire are on the capacitor. The black wire is connected with terminal four.) 5) Remove the fixing screws.(3 pcs)	 

		6) Remove the fan motor.	
3	Electrical parts	How to remove the electrical parts. 1) Perform work of item 1,2. 2) Remove the screw on the middle metal plate. 3) Remove the wires connected with the compressor.(Red wire connects with terminal one, the blue wire and white wire connect with the compressor capacitor) 4) Remove the wires connected with the 4-way valve. 5) Remove the electrical parts.	 

4	Compressor	How to remove the compressor. 1) Perform work of item 1,2,3. 2) Remove the ground wire and remove the discharge pipe and suction pipe with a burner. 3) Remove the nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.